Intelect TRANSPORT® COMBO

SERVICE MANUAL

Moving
Rehabilitation
Forward™

MODEL - 2738
TRANSPORT COMBO
THERAPY SYSTEM

CHATTANOOGA GROUP
ISO 13485 CERTIFIED

TABLE OF CONTENTS

FOREWORD 1
1- SAFETY PRECAUTIONS 2-4
1.1 Precautionary Symbol Definitions 2
1.2 Safety Precautions 2
2- THEORY OF OPERATION 5
2.1 Overview 5
2.2 Power Supply Circuit 5
2.3 Control Board 5
2.4 Stim Boards 5
2.5 Ultrasound Board and Applicator 5
2.6 User Interface and Accessories 5
2.7 NIMH Battery (Optional) 5
3- NOMENCLATURE 6-8
3.1 Components and Controls 6
3.2 Hardware and Software Symbol Definitions 7
4- SPECIFICATIONS 9-13
4.1 Intelect Transport Combo System 9
4.2 Intelect Transport Electrotherapy Waveform Specifications 10
4.3 Intelect Transport Combo Ultrasound Specifications 13
5- TROUBLESHOOTING 14-28
5.1 Intelect Transport Combo Error Messages 14
5.2 Intelect Transport Combo System Testing 16
5.3 Electrical Safety 17
5.4 Leakage Tests 17
5.5 Visual Inspection 18
5.6 Unit Startup and Fan Testing 18
5.7 Electrical Stimulator Test System Setup 19
5.8 Interferential Mode Test 20
5.9 Premodulated Mode Test 20
5.10 Russian Mode Test 21
5.11 High Voltage Pulsed Current (HVPC) Mode Test 22
5.12 Ultrasound Tests . . . . . 23 - 28
5.13 Ultrasound Applicator Identification Test 23
5.14 Ultrasound Applicator Output Test 24
5.15 Ultrasound Duty Cycle Test 26
5.16 Combo Operation Test 28
6- REMOVAL & REPLACEMENT 29-40
6.1 Separating Top and Bottom 29
6.2 Therapy System Fan 30
6.3 Power Supply 31
6.4 Channel 1 Stim Board 33
6.5 Channel 2 Stim Board 34
6.6 Ultrasound Board 35
6.7 Control Board Assembly 36
6.8 LCD 38
6.9 Keymat, On/Off Button and Unit Top 39
6.10 Plynth 40
7- GENERAL MAINTENANCE 41
7.1 Cleaning the System 41
7.2 Calibration Requirements 41
7.3 Field Service 41
7.4 Factory Service 41
8- ULTRASOUND APPLICATOR CALIBRATION 42
8.1 General Procedures 42
9- PARTS 43-47
10- SCHEMATICS 48-66
11- WARRANTY 67

FOREWORD

Read, understand, and follow the Safety Precautions and all other information contained in this manual.

This manual contains the necessary safety and field service information for those field service technicians, certified by Chattanooga Group, to perform field service on the Intelect Transport® Combo Therapy System.

At the time of publication, the information contained herein was current and up-to-date. However, due to continual technological improvements and increased clinical knowledge in the field of electrotherapy, as well as Chattanooga Group's policy of continual improvement, Chattanooga Group reserves the right to make periodic changes and improvements to their equipment and documentation without any obligation on the part of Chattanooga Group. As significant changes occur to the Intelect Transport Combo Therapy System, service bulletins may be made available on our web site (chattgroup.com) in lieu of reprinted manuals.

Technicians repairing the Intelect Transport Combo Therapy System agree to assume all risk and liability associated with this process.

This system is to be used only under the supervision of a licensed practitioner.

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1- SAFETY PRECAUTIONS

1.1 PRECAUTIONARY SYMBOL DEFINITIONS

The precautionary instructions found in this manual are indicated by specific symbols. Understand these symbols and their definitions before operating or servicing this equipment. The definitions of these symbols are as follows:

A. CAUTION

Text with a "CAUTION" indicator will explain possible safety infractions that have the potential to cause minor to moderate injury or damage to equipment.

⚠ CAUTION

B. WARNING

Text with a "WARNING" indicator will explain possible safety infractions that will potentially cause serious injury and equipment damage.

⚠ WARNING

C. DANGER

Text with a "DANGER" indicator will explain possible safety infractions that are imminently hazardous situations that would result in death or serious injury.

⚠ DANGER

D. DANGEROUS VOLTAGE

Text with a "Dangerous Voltage" indicator serves to inform the user of possible hazards resulting in the electrical charge delivered to the patient in certain treatment configurations of TENS waveforms.

E. CORROSIVE HAZARD (NIMH BATTERY)

Text with a "Corrosive Hazard" indicator will explain possible safety infractions if the chemical components of this product are exposed to air, skin, or other materials.

F. NOTE:

Throughout this manual "NOTE" may be found. These Notes are helpful information to aid in the particular area or function being described.

1.2 SAFETY PRECAUTIONS

Read, understand, and follow all safety precautions found in this manual. Below are general safety precautions that must be read and understood before attempting any service techniques on these systems.

⚠ CAUTION

- Read, understand, and practice the precautionary and operating instructions. Know the limitations and hazards associated with using any electrical stimulation or ultrasound device. Observe the precautionary and operational decals placed on the unit.
- DO NOT operate the Intelect Transport Combo unit when connected to any unit other than Chattanooga Group devices.
- DO NOT operate this unit in an environment where other devices are being used that intentionally radiate electromagnetic energy in an unshielded manner. Portable and mobile RF communications equipment can affect Medical Electrical Equipment.
- DO NOT use sharp objects such as a pencil point or ballpoint pen to operate the buttons on the control panel.
- This unit should be operated, transported, and stored in temperatures between 15 °C and 40 °C (59 °F and 104 °F), with relative humidity ranging from 30%-60%, and where the atmospheric pressure is between 950 h Pa and 1050 h Pa.
- The Intelect battery pack is designed for use only with Chattanooga Group Intelect Transport, Stim, Combo, and Ultrasound systems.
- The unit should be routinely checked before each use to determine that all controls function normally; especially that the intensity control properly adjusts the intensity of the electrotherapy and ultrasonic power output in a stable manner. Also, determine that the treatment time control actually terminates electrotherapy and ultrasonic power output when the timer reaches zero.
- Inspect cables and connectors before each use.
- The Intelect Transport Combo is not designed to prevent the ingress of water or liquids. Ingress of water or liquids could cause malfunction of internal components of the system and therefore create a risk of injury to the patient.
- DO NOT permit any foreign materials or liquids to enter the unit. Take care to prevent any foreign materials including, but not limited to, inflammables, water, and metallic objects from entering the unit. These may cause unit damage, malfunction, electrical shock, fire, or personal injury.
- Handle the applicator with care. Inappropriate handling of the applicator may adversely affect its characteristics.
- Before each use, inspect the applicator for cracks, which may allow the ingress of conductive fluid.
- This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. Harmful interference to other devices can be determined by turning this equipment on and off. Try to correct the interference using one or more of the following: reorient or relocate the receiving device, increase the separation between the equipment, connect the equipment to an outlet on a different circuit from that to which the other device(s) are connected and consult the factory field service technician for help.

1.2 SAFETY PRECAUTIONS (CONTINUED)

⚠ CAUTION

- Where the integrity of the external protective earth conductor arrangement is in doubt, equipment shall be operated from its internal electrical power source.
- Using a high intensity electrotherapy setting in conjunction with high intensity ultrasound setting may cause the unit to reset.
- The battery pack should be removed when storing the unit for extended periods of time.
- DO NOT disassemble, modify, or remodel the unit or accessories. This may cause unit damage, malfunction, electrical shock, fire, or personal injury.
- DO NOT remove the cover. This may cause unit damage, malfunction, electrical shock, fire, or personal injury. There are no user-serviceable parts inside the unit. If a malfunction occurs, discontinue use immediately and consult the dealer for repair service.
- Failure to use and maintain the Intelect Transport Combo and its accessories in accordance with the instructions outlined in this manual will invalidate your warranty.
- Nylatex® Wraps contain dry natural rubber and may cause allergic reactions in patients with allergies to latex.

⚠ WARNING

- These devices are restricted to sale by, or on the order of, a physician or licensed practitioner. This device should be used only under the continued supervision of a physician or licensed practitioner.
- Make certain the unit is electrically grounded by connecting only to a grounded electrical service receptacle conforming to the applicable national and local electrical codes.
- The Intelect Transport Combo should not be used adjacent to or stacked with other equipment, and if adjacent or stacked use is necessary, the Intelect Transport Combo should be observed to verify normal operation in the configuration in which it will be used.
- The user must keep the device out of the reach of children.
- Powered muscle stimulators should be used only with the leads and electrodes recommended for use by the manufacturer.
- Before administering any treatment to a patient you should become acquainted with the operating procedures for each mode of treatment available, as well as the indications, contraindications, warnings, and precautions. Consult other resources for additional information regarding the application of electrotherapy and ultrasound.
- To prevent electrical shock, disconnect the unit from the power source before attempting any maintenance procedures.
- Keep electrodes separated during treatment. Electrodes in contact with each other could result in improper stimulation or skin burns.

⚠ WARNING

- Long term effects of chronic electrical stimulation are unknown.
- Stimulation should not be applied over the anterior neck or mouth. Severe spasm of the laryngeal and pharyngeal muscles may occur and the contractions may be strong enough to close the airway or cause difficulty in breathing.
- Stimulation should not be applied transthoracically because the introduction of electrical current into the heart may cause cardiac arrhythmia.
- Stimulation should not be applied over swollen, infected, and inflamed areas or skin eruptions, e.g., phlebitis, thrombophlebitis, varicose veins, etc.
- Stimulation should not be applied over, or in proximity to, cancerous lesions.
- Output current density is inversely related to electrode size. Improper application may result in patient injury.
- Always keep the sound head in constant motion.
- Always keep the sound head in full contact with the patient's skin or submerged under water when setting intensity.
- Use ample conductive gel to ensure good coupling throughout the treatment. If needed, apply when setting intensity.
- Be sure to read all instructions for operation before treating a patient.
- Dispose of all products in accordance with local and national regulations and codes.
- Use of controls, adjustments, or performance of procedures other than those specified herein may result in hazardous exposure to ultrasonic energy.
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous conditions causing damage to the battery pack or cells.
- To prevent electrical shock, disconnect the battery pack from the system before attempting any maintenance procedures.
- Do not drop the applicator on hard surfaces. Do not cool an overheated sound head with ice water or ice packs. Do not allow the sound head to reach maximum temperatures repeatedly. All of these conditions are likely to damage the sound head crystal. Damage resulting from these conditions is not covered under the warranty.
- In the event that an Error message or Warning appears beginning with a 2 or 3, immediately stop all use of the unit and contact the dealer or Chattanooga Group for service. Errors and Warnings in these categories indicate an internal problem with the unit that must be tested by Chattanooga Group or a Field Service Technician certified by Chattanooga Group before any further operation or use of the system.

1.2 SAFETY PRECAUTIONS (CONTINUED)

⚠ WARNING

- Use of a unit that indicates an Error or Warning in these categories may pose a risk of injury to the patient, user, or extensive internal damage to the system.
- Do not turn the unit on or off while it is connected to the patient.
- Do not apply the Ultrasound Applicator to the patient during the Head Warming period. Applicator must remain in Applicator Hook during the Head Warming period.
- Use only accessories that are specially designed for this unit. Do not use accessories manufactured by other companies on this unit. Chattanooga Group is not responsible for any consequence resulting from using products manufactured by other companies. The use of other accessories or cables may result in increased emissions or decreased immunity of this unit.

⚠ DANGER

- Stimulus delivered by the waveforms of this device, in certain configurations, will deliver a charge of 25 microcoulombs (µC) or greater per pulse and may be sufficient to cause electrocution. Electrical current of this magnitude must not flow through the thorax because it may cause a cardiac arrhythmia.
- Patients with an implanted neurostimulation device must not be treated with or be in close proximity to any shortwave diathermy, microwave diathermy, therapeutic ultrasound diathermy, or laser diathermy anywhere on their body. Energy from diathermy (shortwave, microwave, ultrasound, and laser) can be transferred through the implanted neurostimulation system, can cause tissue damage, and can result in severe injury or death. Injury, damage, or death can occur during diathermy therapy even if the implanted neurostimulation system is turned "off."
- DO NOT connect the unit to an electrical supply without first verifying that the power supply is the correct voltage.
- Incorrect voltage may cause unit damage, malfunction, electrical shock, fire, or personal injury. Your unit was constructed to operate only on the electrical voltage specified on the Voltage Rating and Serial Number Plate. Contact your Chattanooga Group dealer if the unit is not properly rated.

⚠ DANGER

- NiMH Batteries contain Class E corrosive materials. In the event of battery cell rupture or leakage, handle battery pack wearing neoprene or natural rubber gloves. Contents of a ruptured or leaking battery can cause respiratory irritation. Hypersensitivity to nickel can cause allergic pulmonary asthma. Contents of cell coming in contact with skin can cause skin irritation and/or chemical burns.
- Never, under any circumstances, open the battery pack housing or cells. Should an individual battery from a battery pack become disassembled, spontaneous combustion of the negative electrode is possible. There can be a delay between exposure to air and spontaneous combustion.
- Charge the battery pack according to the instructions found in this manual. Never attempt to charge the battery pack on any other charging mechanism.
- Use the battery pack only with the Intelect Transportable units.
- Do not reverse the polarity of the battery pack. Doing so can increase the individual cell temperature and cause cell rupture or leakage.
- Never dispose of the battery pack in fire. Never short circuit the battery pack. The battery pack may explode, ignite, leak, or get hot causing serious personal injury.
- Dispose of NiMH batteries according to national, state, and local codes and regulations.

2- THEORY OF OPERATION

2.1 OVERVIEW

The Intelect Transport Combo Therapy System is comprised of several PC board assemblies housed within a common enclosure. These assemblies each support a distinct function in the product. The basic elements are User Interface, Control Board, Stim Boards, Ultrasound Board, Ultrasound Applicator, and Power Supply Circuits.

2.2 POWER SUPPLY CIRCUIT

A universal 75 Watt input power supply provides the system with the required 24 volts DC. The supply is connected to the mains at all times when the Mains Power Cord is attached and plugged into an outlet supplying 100 - 240 VAC. The 24 V supply is regulated locally at each PC board as required.

2.3 CONTROL BOARD

The Control Board serves just as its name implies. It controls the operation of the Stim Boards, Ultrasound Board, User Interface, and Accessories. The Control Board communicates to the Stim Boards and Ultrasound Board through a proprietary bus. The Control Board drives the display. The Control Board reads the menu buttons. The Control Board also reads the amplitude and the Contrast Control on the systems. Sound output is generated by the Control Board and routed to an internal speaker.

2.4 STIM BOARDS

The Stim Boards create all muscle stimulation output. Communication to the Stim Boards is via a proprietary bus. A Processor on each Stim Board acts on messages passed to it by the Control Board to set up waveforms and adjust output amplitude. Information can likewise be passed from each Stim Board back to the Control Board for monitoring current, etc. If a Stim Board does not respond as expected to a command from the Control Board, output is stopped and an Error Message is generated.

2.5 ULTRASOUND BOARD AND APPLICATOR

The Ultrasound Board generates the 1 or 3.3 MHz output to drive the Sound Head of the Applicator. The Ultrasound Board is accessed through the proprietary bus by the Control Board. It can provide current and voltage information about the ultrasound output of the board. The calibration data for the Sound Head is passed through the Ultrasound Board from the Applicator to the Control Board. By storing the calibration data in the Applicator, there is no calibration necessary for the Ultrasound Board and any calibrated Chattanooga Group Intelect Transport Ultrasound Applicator can be connected and operated to provide accurate output.

2.6 USER INTERFACE AND ACCESSORIES

The LCD display panel provides the operator visible feedback in the way of menu choices. Pressing the User Interface buttons makes selections from the menus. The Control Board interprets these user inputs and responds accordingly. Audible feedback is given for such events as key presses and end of treatment.

2.7 NIMH BATTERY (OPTIONAL)

The NiMH Battery Module incorporates a Nickel Metal Hydride (NiMH) Battery Pack and a PC Board. The PC Board monitors the Battery Charge Level. The Battery Pack supplies the required 24 VDC to the system which is then distributed to the respective PCB's through the Universal Power Supply. The Battery Pack is interfaced with the system via a Wire Harness that facilitates communication with the Control Board and delivery of power to the Combination Therapy System. When the Therapy System is connected to a Mains Power Supply via the Mains Power Cord, the NiMH Battery Pack will charge. Once the Battery Pack is fully charged, the software will stop the charging process, eliminating the possibility of overcharging. Battery power is used only when the Therapy System is not connected to a Mains Power Supply.

3.1 COMPONENTS AND CONTROLS

The nomenclature graphics below, Figure 3.1, indicate the general locations of the exterior components of the Intelect Transport Combo System.

Know the components and their functions before performing any operation of or service to the Intelect Transport Combo System.

FIGURE 3.1

3.2 HARDWARE AND SOFTWARE SYMBOL DEFINITIONS

The symbols below are found on the system as well as within the software. These symbols are defined for the purpose of recognition and functionality when operating or performing service on the Intelect Transport Combo System.

Know the symbols and their definitions before performing any operation of or service to the Intelect Transport Combo System.

Intelect Transport Combo System Hardware Symbols

Power On/Off

The Power On/Off button controls the flow of electricity to the unit.

NOTE: Make certain there are no electrodes on the patient when turning the unit on or off.

LCD

The LCD (Liquid Crystal Display) allows the user to view and monitor the information displayed before, during, and after therapy.

Clinical Library

Select this button to access the following functions:

- Retrieve User Protocol
- Restore Factory Settings
- Restore Factory Protocols
- Languages
- View Unit Information

TIME

Press the Up or Down arrow buttons to set total treatment time of therapy.

Back

Use this button to return to the previous window.

STOP

Select this button to stop a treatment session.

Down Arrow

When the window displays a list of options, press the Down Arrow button to scroll down the list.

PAUSE

Use this button to pause the treatment session. To restart therapy, press the PAUSE button.

Sound Head

The aluminum face of the applicator that contacts the patient's skin. It covers a transducer mechanism that converts electrical energy to mechanical energy in the form of a vibrating crystal.

LED Indicator (Output Power)

When illuminated, this green light signifies that ultrasound energy is being distributed through the applicator.

Applicator

The hand held assembly used to deliver ultrasonic energy. The applicator includes the sound head, transducer, and related electronics.

Accessory Panel

The Accessory Panel serves as a port of connection for the electrodes and ultrasound applicator.

Channel 1 Lead Wire Connection

This port serves as the connection point between the unit and the Channel 1 Lead Wire.

Channel 2 Lead Wire Connection

This port serves as the connection point between the unit and the Channel 2 Lead Wire.

3.2 HARDWARE AND SOFTWARE SYMBOL DEFINITIONS (CONTINUED)

Ultrasound Applicator Connection
This port serves as the connection point between the unit and the ultrasound applicator.

START
Select Start to begin a treatment session.

Parameter Display/Enter
Select this button to display the parameters of the waveform during treatment. Also, this button is used to accept the highlighted selection.

INTENSITY
Use the up or down arrow on the INTENSITY button to increase or decrease output power.

Up Arrow
When the window displays a list of options, press the Up Arrow button to scroll up the list.

Battery Indicator
When displayed on the LCD, this symbol indicates the battery pack option is present on the unit. This symbol also displays the charge status of the battery.

LCD Intensity/Contrast Dial
If the intensity of the LCD display diminishes, turn the dial until the display contrast is optimal.

Charge Indicator
This symbol displays when the unit is connected to mains power and the battery pack is charging.

NOTE: During battery operation, if the unit is left on, but is not active for more than five minutes, it will power off to conserve battery power. To restore power, press the Power On/Off button.

4- SPECIFICATIONS

4.1 INTELECT TRANSPORT COMBO SYSTEM

Figure 4.1 below provides physical details of the Intelect Transport Combo. This section also provides waveform specifications to aid in troubleshooting.

Refer to this section when performing troubleshooting, replacement, and repair of the Intelect Transport Combo System.

A. Intelect Transport Combination Therapy System Physical Specifications

FIGURE 4.1

Dimensions

Width ..... 10.125 in (25.7 cm)
Height ..... 7.250 in (18.4 cm)
Depth ..... 11.5 in (29.2 cm)

Weight

Standard Weight (with base) ..... 5.07 lb (2.3 kg)
Battery Pack ..... 1.87 lb (0.85 kg)

Power

Input ..... 100 - 240 VAC, 50/60 Hz 100 VA
Output ..... +24 V, 3.125 A
Electrical Class ..... CLASS I

Electrical Type

Ultrasound TYPE B .....
Electrotherapy TYPE BF .....
Battery Type ..... Nickel Metal Hydride (NiMH) (1.2 V x 20 size AA)

Operating Environment

Temperature ..... Between 59 °F and 104 °F (15° C and 40° C)
Relative Humidity 30%-60%
Atmospheric Pressure ..... 950-1,050 h Pa

Complies with:
UL/IEC/EN 60601-1
IEC/EN 60601-1-2
IEC 60601-2-10
IEC 60601-2-5

4.2 INTELECT TRANSPORT COMBO ELECTROTHERAPY WAVEFORM SPECIFICATIONS

The specifications found in this section provide the necessary waveform specifications to aid in troubleshooting. A waveform graphic from an oscilloscope is also provided for clarification.

Refer to this section when performing troubleshooting, replacement, and repair of the Intelect Transport Combo System.

A. High Voltage Pulsed Current (HVPC)- Figure 4.2 (Factory Default Setting)

The High Voltage Pulsed Current (HVPC) has a very brief pulse duration characterized by 2 distinct peaks delivered at high voltage. The waveform is monophasic (current flows in one direction only). The high voltage causes a decreased skin resistance, making the current comfortable and easy to tolerate.

Output Mode. . . . . Electrodes

Amplitude. . . . . 0-500 V*

Polarity . . . . . Positive or Negative **(Negative)**

Ramp. . . . . .0.5 sec, 1 sec, 2 sec, 5 sec **(2 sec)**

Display . . . . . Peak Current or Volts **(Volts)**

Sweep. . . . . .Off, 80/120 pps, 1/120 pps, 1/10 pps **(Off)**

Frequency. . . . . 10-120 pps **(100 pps)**

Cycle Time. . . . . 5/5, 4/12, 10/10, 10/20, 10/30, 10/50, and Continuous **(Continuous)**

Constant Mode . . . . . CV (only)** **(CV)**

Treatment Time. . . . . .1-60 Minutes **(20 min)**

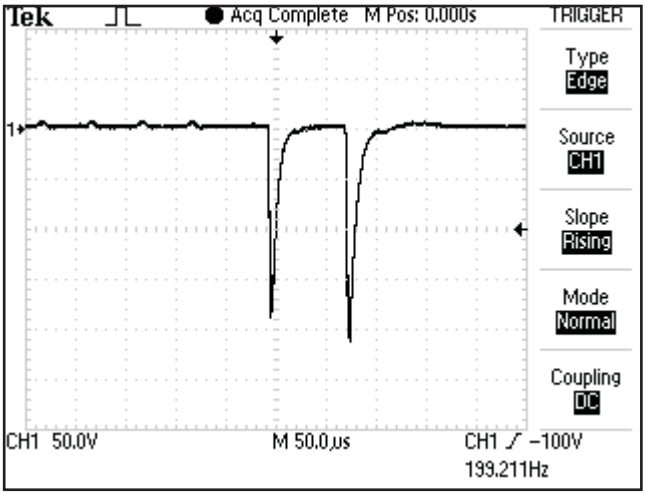


FIGURE 4.2

* ESTI-2 Load Box

** CV = Constant Voltage

4.2 INTELECT TRANSPORT COMBO ELECTROTHERAPY WAVEFORM SPECIFICATIONS (CONTINUED)

B. Premodulated - Figure 4.3 (Factory Default Setting)

Premodulated Current is a medium frequency waveform. Current is distributed from one channel (two electrodes). The current intensity is modulated: it increases and decreases at a regular frequency (the Amplitude Modulation Frequency).

Output Mode. . . . . Electrodes

Amplitude. . . . . .0-100 mA*

Carrier Frequency. . . . . 2500 Hz **(2500 Hz)**

Ramp. . . . . .2 sec **(2 sec)**

Display . . . . . .Peak Current or Volts **(Volts)**

Sweep. . . . . On, 1-200 Hz **(On)**

Cycle Time. . . . . 5/5, 4/12, 10/10, 10/20, 10/30, 10/50, and Continuous **(Continuous)**

Beat Low Frequency . . . . . 1- 199 Hz

Beat High Frequency . . . . . .2-200 Hz

Constant Mode . . . . . CC or CV** **(CC)**

Treatment Time. . . . . .1-60 Minutes **(20 min)**

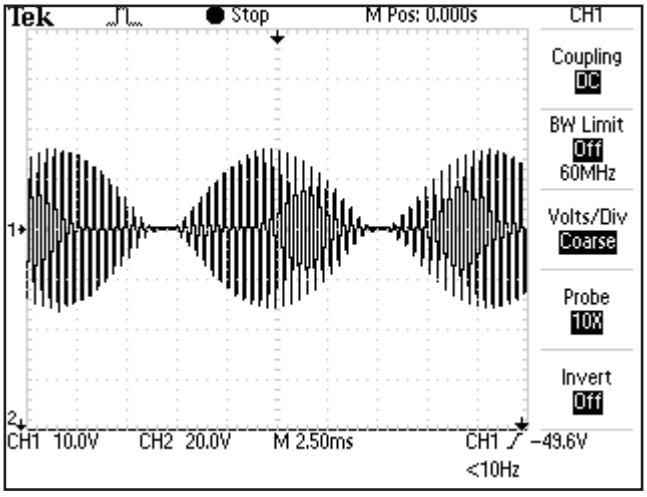


FIGURE 4.3

* ESTI-2 Load Box

**CC= Constant Current
CV= Constant Voltage

4.2 INTELECT TRANSPORT COMBO ELECTROTHERAPY WAVEFORM SPECIFICATIONS (CONTINUED)

C. Interferential - Figure 4.4 (Factory Default Setting)

Interferential Current is a medium frequency waveform. Current is distributed from two channels (four electrodes). The currents cross in the body within the area being treated. The two currents interfere with each other at this crossing point, resulting in a modulation of the intensity (the current intensity increases and decreases at a regular frequency).

Output Mode. . . . . Electrodes

Amplitude. . . . . .0-100 mA*

Carrier Frequency. . . 2500 - 5000 Hz **(4000 Hz)**

Vector Scan. . . . .Manual, Automatic 40%, 100% **(Manual)**

Vector Position . . . . . 0 - 90 Degrees **(45˚)**

Sweep. . . . . .On, 1-200 Hz

Beat Low Frequency . . . . . 1-199 Hz **(80Hz)**

Beat High Frequency . . . . . .2-200 Hz **(150Hz)**

Constant Mode. . . . . CC or CV** **(CC)**

Treatment Time . . . . . 1 -60 minutes **(20 min)**

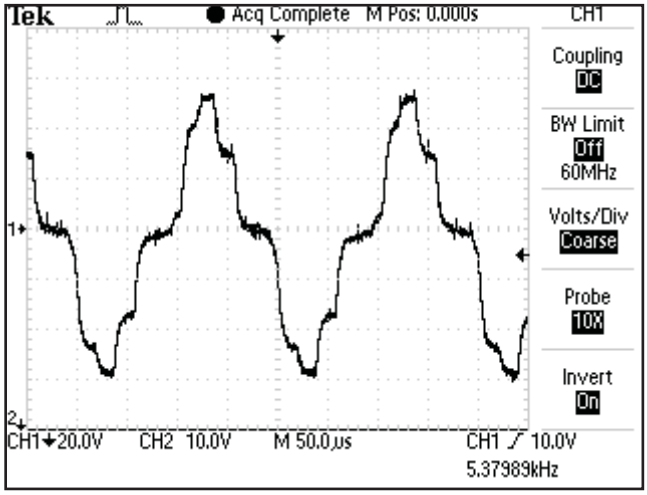


FIGURE 4.4

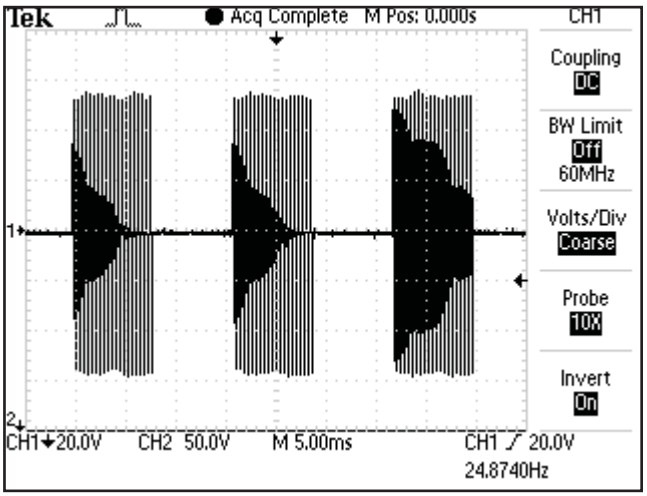


FIGURE 4.5

D. Russian- Figure 4.5 (Factory Default Setting)

Russian Current is a sinusoidal waveform delivered in bursts or series of pulses. This method was claimed by its author (Kots) to produce maximal muscle strengthening effects without significant discomfort to the patient.

Output Mode. . . . . Electrodes

Amplitude. . . . . .0-100 mA*

Channel Mode. . 10%, 20%, 30%, 40%, and 50% **(50%)**

Constant Mode. . . . . CC or CV** **(CC)**

Cycle Time. . . . . 5/5, 4/12, 10/10, 10/20, 10/30, 10/50, and Continuous **(10/50)**

Ramp. . . . 0.5 sec, 1 sec, 2 sec and 5 sec **(2 sec)**

Carrier Frequency. . . . . 2500 Hz **(2500 Hz)**

Burst Frequency . . . . . 20 -100 Hz **(50 Hz)**

Treatment Time . . . . . 1 -60 minutes **(20 min)**

* ESTI-2 Load Box

**CC= Constant Current
CV= Constant Voltage

4.3 INTELECT TRANSPORT COMBO THERAPY SYSTEM ULTRASOUND SPECIFICATIONS

This section provides the necessary Ultrasound Specifications to aid in troubleshooting. Refer to these specifications as necessary when troubleshooting the Ultrasound PC Board and Applicators.

A. Ultrasound

Frequency . . . . . 1 MHz, ± 5%; 3.3 MHz, ±5%

Duty Cycles . . . . 10%, 20%, 50%, and Continuous

Pulse Frequency . . . . . 100 Hz

Pulse Duration . . . . 1 mSec, ±20%; 2 mSec, ±20%
5 mSec, ±20%

Output Power

10 cm^2 Crystal . . . . . 0-20 Watts at 1 MHz,
0-10 Watts at 3.3 MHz

5 cm^2 Crystal . . . . . 0-10 Watts, 1 and 3.3 MHz

2 cm^2 Crystal . . . . . .0-4 Watts, 1 and 3.3 MHz

1 cm^2 Crystal . . . . . 0-2 Watts 3.3 MHz Only

Amplitude . . 0 - 2.5 w/cm^2 in Continuous mode,
0-3 w/cm^2 in Duty Cycle modes

Output accuracy. . . . . .± 20% above 10% of maximum

Temporal Peak to Average Ratios:

2:1, ± 20%, at 50% Duty Cycle

5:1, ± 20%, at 20% Duty Cycle

9:1, ± 20%, at 10% Duty Cycle

Beam Non uniformity Ratio . . . . . 5.0 : 1 maximum

Beam Type. . . . . Collimating

Effective Radiating Areas

10 cm^2 Crystal - 6.8 cm^2 - 10.0 cm^2

5 cm^2 Crystal - 3.5 cm^2 - 5.0 cm^2

2 cm^2 Crystal - 1.4 cm^2 - 2.0 cm^2

1 cm^2 Crystal - 0.7 cm^2 - 1.0 cm^2

Treatment Time. . . . . .1-30 Minutes

B. Head Warming Feature Specifications

The Head Warming feature of an Intelect Transport Combo Therapy System utilizes Ultrasound output resulting in warming of the Sound Head to increase patient comfort.

With Head Warming enabled, ultrasound is emitted without pressing the START button. The Applicator LED will not illuminate during the Head Warming period. US Channel will indicate "Warming".

Output . . 0 - 50% Cycling of maximum power

Frequency . . . . . .3.3 MHz

Sound Head Temperature . . . . . 85 °F - 110 °F
(29.4 °C - 43.3 °C)

⚠ WARNING

Do not apply the Ultrasound Applicator to the patient during the Head Warming period. Applicator must remain in Applicator Hook during the Head Warming period.

5.1 INTELECT TRANSPORT COMBO THERAPY SYSTEM ERROR MESSAGES

A. The following information is provided as an aid in defining the Software Error Messages of the Intelect Transport Therapy System. Once a particular Error Message is defined, the information will also list probable causes and possible remedies. Once the problem area is determined, subsequent tests for verification will be necessary to determine a "Bad Board".

All Troubleshooting and tests will be to validate a "Bad Board" only. No component level troubleshooting information is or will be provided by Chattanooga Group for field troubleshooting of board components.

B. Once a particular PC Board has been determined as bad, refer to the appropriate Removal and Replacement Section for the board affected and follow the instructions for replacement of the board.

ERROR CODE	ERROR TYPE	DEFINITION	PROBABLE CAUSES	POSSIBLE REMEDY
USER CORRECTABLE WARNING MESSAGES				
100 101	WARNING WARNING	Ultrasound Applicator became unplugged Ultrasound Applicator unplugged	Ultrasound Applicator was unplugged while an Ultrasound treatment was running User attempted to start an Ultrasound treatment, but no Ultrasound Applicator was plugged into unit	Plug Ultrasound Applicator into proper receptacle on unit making certain it is completely seated
102	WARNING	Ultrasound Applicator not calibrated	The Ultrasound Applicator plugged into the unit needs to be calibrated	Contact dealer or Chattanooga Group for service.
103 104 105	WARNING WARNING WARNING	Ultrasound Channel not available Stim Channel not available Stim Channel not available	User attempted to select Combo treatment, but the Ultrasound Channel was already in use User attempted to select Combo treatment, but the Ultrasound Channel was already in use User attempted to select a two channel Electrotherapy treatment, but at least one of the two stim channels were already in use	Wait until Ultrasound treatment is completed or stop Ultrasound treatment and try again
106	WARNING	Over current	Stim channel has exceeded allowed current level and the treatment has been stopped	Reset treatement parameters and attempt session again
107	WARNING	Bad Contact Quality	Electrode contact is poor	Apply new electrodes to the treatment area
108	WARNING	Shorted Lead Wires	Lead Wires are bad	Replace with new lead wires
109	WARNING	Power Supply current limit	User attempted to start two channels of Electrotherapy while running an Ultrasound treatment with a 10 cm^2 Ultrasound Applicator and Ultrasound Output is currently set to greater than 15 Watts.	Wait until Ultrasound treatment is completed or stop Ultrasound treatment and try again or decrease ultrasound output to less than 15 Watts
ERROR MESSAGES (200-213) REQUIRING TECHNICAL ASSISTANCE				
200	ERROR	Error while attempting to save Ultrasound Applicator Calibration Data	Could not save the Calibration Data to the Ultrasound Applicator	**1.** Replace the Ultrasound Applicator with a known good Ultrasound Applicator **2.** Replace Ultrasound Board **3.** Replace Control Board

In the event that an Error message or Warning appears beginning with a 2 or 3, immediately stop all use of the unit and contact the dealer or Chattanooga Group for service. Errors and Warnings in these categories indicate an internal problem with the unit that must be tested by Chattanooga Group or a Field Service Technician certified by Chattanooga Group before any further operation or use of the unit. Use of a unit that indicates an Error or Warning in these categories may pose a risk of injury to the patient, user, or may cause extensive internal damage to the unit.

5.1 INTELECT TRANSPORT COMBO THERAPY SYSTEM ERROR MESSAGES (CONTINUED)

⚠ WARNING

In the event that an Error message or Warning appears beginning with a 2 or 3, immediately stop all use of the unit and contact the dealer or Chattanooga Group for service. Errors and Warnings in these categories indicate an internal problem with the unit that must be tested by Chattanooga Group or a Field Service Technician certified by Chattanooga Group before any further operation or use of the unit. Use of a unit that indicates an Error or Warning in these categories may pose a risk of injury to the patient, user, or may cause extensive internal damage to the unit.

ERROR CODE	ERROR TYPE	DEFINITION	PROBABLE CAUSES	POSSIBLE REMEDY
ERROR MESSAGES (200-213) REQUIRING TECHNICAL ASSISTANCE (CONTINUED)				
201	ERROR	Error Applicator not calibrated OK.	Could not calibrate Ultrasound Applicator	**1.** Attempt to calibrate again **2.** Replace the Ultrasound Applicator with a known good Ultrasound Applicator **3.** Replace Ultrasound Board **4.** Replace Control Board
202	ERROR	Timed out while saving the Ultrasound Applicator Calibration Data.	Could not save the Calibration Data to the Ultrasound Applicator	**1.** Replace the Ultrasound Applicator with a known good Ultrasound Applicator **2.** Replace Ultrasound Board **3.** Replace Control Board
203	ERROR	Error reading Protocol.	Error reading a Protocol from the EEPROM	Restore Factory Settings, restore Factory Protocols and rebuild all User Protocols
204 205 206 207 208	ERROR ERROR ERROR ERROR ERROR	Main Software Flash Erase Error Main Software Flash Echo Main Software CRC Error Main Software Program Flash Error Main Software Acknowledge Error	Stim Main Software upgrade Error Stim Main Software upgrade Error Stim Main Software upgrade Error Stim Main Software upgrade Error Stim Main Software upgrade Error	**1.** Replace appropriate Stim Board **2.** Replace Control Board
209	ERROR	Software CRC Acknowledge Error.	Software upgrade Error	Replace Control Board
210 211 212 213 214	ERROR ERROR ERROR ERROR ERROR	Channel Software Flash Erase Error Channel Software CRC Error Channel Software Program Flash Error Channel Software Acknowledge Error Channel Software CRC Acknowledge Error	Stim Channel Software upgrade Erro. Stim Channel Software upgrade Error Stim Channel Software upgrade Error Stim Channel Software upgrade Error Stim Channel Software upgrade Error	**1.** Replace appropriate Stim Board **2.** Replace Control Board
CRITICAL ERRORS (300-314) DEMANDING TECHNICAL SERVICE				
300	CRITICAL ERROR	Unit CFG Critical Error	Error communicating with Stim Board on Powerup	**1.** Replace appropriate Stim Board **2.** Replace Control Board
301	CRITICAL ERROR	No Stim Board Critical Error	Error detecting Stim Board on Powerup	**1.** Replace appropriate Stim Board **2.** Replace Control Board
302	CRITICAL ERROR	No Ultrasound Board Critical Error	Error detecting Ultrasound Board on Powerup	**1.** Replace Ultrasound Board **2.** Replace Control Board
303	CRITICAL ERROR	EEPROM Critical Error	Error reading EEPROM on Powerup.	Replace Control Board
304 305 306 307 308 309	CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR	Ultrasound Board Critical Error Ultrasound Board Write Critical Error Ultrasound Board Read_Write Critical Error Ultrasound Board Reset Critical Error Ultrasound Board Read Critical Error Ultrasound Board Calibration Critical Error	Error communicating with the Ultrasound Board Error communicating with the Ultrasound Board Error communicating with the Ultrasound Board Ultrasound Board Reset Error Error communicating with the Ultrasound Board Error calibrating Ultrasound Board	**1.** Replace Ultrasound Board **2.** Replace Control Board
CRITICAL ERRORS (300-314) DEMANDING TECHNICAL SERVICE				
310 311 312 313 314 315 316	CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR CRITICAL ERROR	Stim Board Write Critical Error Stim Board Bad Data Read Critical Error Stim Board Main UP Reset Critical Error Stim Board Channel 1 UP Reset Critical Error Stim Board Channel 2 UP Reset Critical Error Stim Board Reset Critical Error Stim Powerup Test Failed Critical Error	Error communicating with Stim Board Error communicating with Stim Board Error communicating with Stim Board Error communicating with Stim Board Error communicating with Stim Board Stim Board Reset Error Stim Board failed its Self Test on Powerup	**1.** Replace appropriate Stim Board **2.** Replace Control Board

5.2 INTELECT TRANSPORT COMBO THERAPY SYSTEM TESTING

A. General

1. The following information is intended to aid in troubleshooting the major components of the Intelect Transport Combo Therapy System to "Board Level" only. These tests are FACTORY standard testing procedures and methods used at the factory before shipment of any Intelect Therapy System.
2. Due to the complex nature of the technology utilized by Chattanooga Group, the recommended troubleshooting techniques are to determine "Bad Board" and board replacement only. No board component level troubleshooting is recommended, nor will information or parts be supplied by Chattanooga Group. Any board component level troubleshooting performed will be at sole risk and liability of the Service Technician performing such troubleshooting techniques.
3. Once a particular PC Board has been determined as bad, refer to the appropriate Removal and Replacement Section of this Manual for proper replacement.

B. Special Tools, Fixtures, & Materials Required

1. Certain tests require the use of special tools and fixtures. These will be listed at the particular test where they are required. Testing with any other special tool or fixture other than those stated could give erroneous readings or test results. Always perform the tests exactly as stated to ensure accurate results.
2. Scope and other standard test equipment settings will be listed for each test performed to aid in performing the test to FACTORY standards and ensure proper readings.
3. The troubleshooting and repair of the Intelect Transport Therapy Systems and Accessories should be performed only by authorized technicians trained and certified by Chattanooga Group.

C. Equipment Required

- Oscilloscope and Probes
- ESTI-2 Load Test Fixture
- Digital Multi meter
- Intelect Transport Applicators (Accessories)
- Dielectric Withstand (Hi-Pot) and ground resistance tester

NOTE:
Adjust Dielectric Withstand tester to indicate fault with 120 k Ohm Load across the output when at specified test voltage.

- Milliohm Meter
- 10k Resistor
- Ohmic Instruments UPM DT 10 or DT 100 Ultrasound Power Meter
- Dissolved Oxygen Test Kit used to test oxygen level of Degassed Water
- # 1 Phillips Screwdriver
- # 2 Phillips Screwdriver
- Insulated Needle Nose Pliers
- 1/4" Nut driver or Wrench
- Degassed Water (<5 ppm) for Ultrasound Power Meter

Recipe(s) for Degassed Water

1) Boil Distilled Water for 30 Minutes. Place water in a canning jar, and cover. Allow to cool to room temperature of approximately 70 °F (21 °C). May be refrigerated to aid cooling time.

or

2) Bring Distilled Water to a boil. Place the container under vacuum for 5 to 10 Minutes.

NOTE:
Canning jars are ideal storage and transport containers for Degassed Water. In order to minimize aeration of Degassed Water during transport, fill to a positive meniscus and slide the lid over the surface. Seal tightly.

When pouring Degassed Water into and out of containers pour slowly down the side of the container to minimize aeration.

Do not use Tap Water or Distilled Water in the Ultrasound Power Meter. Use only Degassed Water in order to obtain correct test results. The chart below illustrates the oxygen content of Degassed, Tap, and Distilled Water.

WATER TYPE	ppm of OXYGEN
Degassed (per Recipe 1 or 2)	Less than 5 ppm
Tap Water	Up to 35 ppm
Distilled Water	Up to 20 ppm

D. Full Functional Tests

Perform the tests found in this section to verify Full Functionality of new Therapy System and accessories.

5.3 ELECTRICAL SAFETY

The Intelect Transport Combo System has been tested to UL 60601-1, Standard for Safety for Medical Equipment.

NOTE:
This device complies with current leakage, ground continuity, and dielectric withstand (Hi-Pot) limits as prescribed by IEC/EN/UL 60601-1 and CSA/CAN 601.1 Medical Electrical, Part 1: General Requirements for Safety.

Facility, local and national limits and test methods may vary.

A. Power Requirements

Model: 2738 . . . . . Input : 100-240V
100 VA, 50/60 Hz

Listed by Intertek Testing Services NA Inc.

Conforms to UL Standard 60601-1

Certified to CAN/CSA Standard C22.2 No. 601.1-M90 w/A2

5.4 LEAKAGE TESTS

Conduct all necessary leakage tests as required per NFPA 99 (National Fire Protection Association) "Health Care Facility" standards.

⚠ WARNING

UNIT FAILING DIELECTRIC WITHSTAND OR LEAKAGE TESTS COULD INDICATE SERIOUS INTERNAL PROBLEMS.

DO NOT PLACE UNIT BACK INTO SERVICE! SEND UNIT TO FACTORY FOR REPAIR! DO NOT ATTEMPT TO REPAIR!

5.5 VISUAL INSPECTION

General

Visually inspect the Intelect Transport Therapy System. A visual inspection can, to an experienced technician, indicate possible abuse of the unit and internal problems.

5.6 UNIT STARTUP AND FAN TESTING

A. Test

1. Place unit face up on work surface.
2. Connect power cord to unit and plug into proper power receptacle.
3. Turn system on. Press the Enter button. IFC should be highlighted. Press the Enter button.
4. Place hand at the back of system, at Contrast Control, to verify fan is blowing out. **See Figure 5.1.**

FIGURE 5.1

B. Test Results

1. Unit will not start, unit failed test.
   a) Possible bad Main Power Switch.
   b) Possible bad Power Supply.
   c) Possible bad power outlet or Mains Power Cord.
2. Screen does not display, unit failed test.
   a) Contrast Control needs adjusting.
   b) Possible bad display.
   c) Possible bad Control Board.
   d) Possible bad Power Supply.
   e) Visually check power LED. LED should illuminate Blue. Turn system off with Power button. Power LED should flash Blue.
   If Power LED illuminates Blue with system On and flashes Blue with system Off, the Power Supply is good. Replace Control Board.
3. Fan not blowing outward, Unit failed test
   a) Fan blowing inward.
   Fan wired wrong. Rewire or replace Fan.
   b) Fan not blowing.
      1) Possible bad Fan.
      2) Possible bad Power Supply.
      3) Possible bad Control Board.

5.7 ELECTRICAL STIMULATOR TEST SYSTEM SETUP

The following tests for Stimulator Outputs will be performed on Channels 1 and 2.

A. Equipment Required

- ESTI-2 Load Test Box
- Calibrated Oscilloscope and Probes

B. System Set Up

1. Install known good Lead Wires to Channels 1 and 2 on the system. **See Figure 5.2.**
2. Connect Lead Wires from the system to the ESTI-2 Load Test Fixture. Channel 1 to Channel 1 IN and Channel 2 to Channel 2 IN. **See Figure 5.3.**
3. Connect Scope Probes to the Channel 1 To SCOPE and Channel 2 To SCOPE Tabs on the ESTI 2 Load Test Fixture respectively. **See Figure 5.3.**
4. Place ESTI-2 Load Switch in the 1 K position. **See Figure 5.3.**
5. Install Power Cord into system and plug into proper Power Supply. Turn system On.

⚠ WARNING

The ESTI - 2 Load Box contains a 10 watt resistor which is not meant for continuous operation. Do not run the ESTI - 2 Load Box continuously.

NOTE:

The ESTI - 2 Load Box, part number 2757, is used to simulate patient resistance when testing waveforms. The ESTI - 2 is set up for both a 1K and 10K load. The 10K load is used for Microcurrent only which is not available on this unit. **See Figure 5.4.**

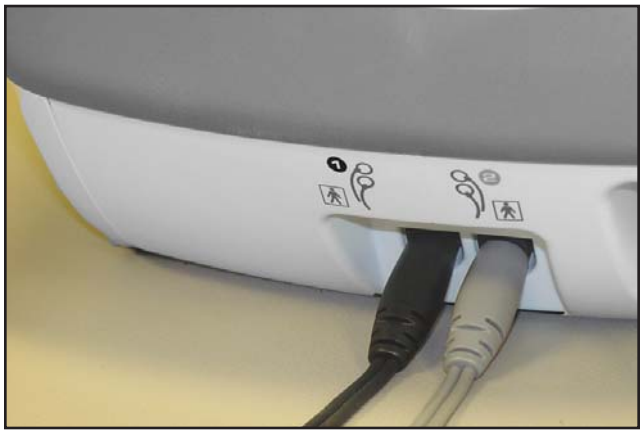


FIGURE 5.2

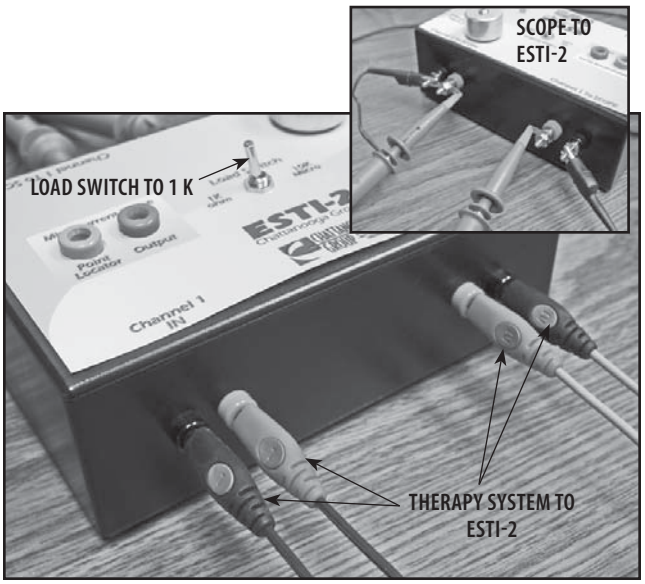


FIGURE 5.3

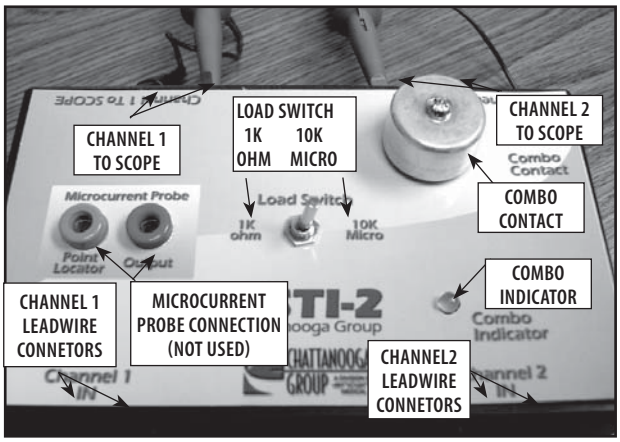


FIGURE 5.4

5.8 INTERFERENTIAL MODE TEST

It is assumed that the unit is ready for tests as described in **5.7 parts A and B**. If not, set up unit per **5.6 parts A and B** prior to performing tests.

A. Interferential Mode Test Procedures

1. Set Scope; Time- 100 µS, Channel- 20 V, and Trigger- DC.
2. Highlight Stim Channel 1. Press the Enter button.
3. Highlight IFC. Press the Enter button.
4. Increase Intensity until 50 is displayed.
5. Press START button.
6. Compare waveform on scope to **Figure 5.5.**
7. Press PAUSE button.
8. Verify that the amplitude displayed below timer drops to zero (0).
9. Verify that Paused is displayed below the displayed amplitude.
10. Press STOP button.

B. Interferential Mode Test Results

1. Waveform is the same between scope and **Figure 5.5**, amplitude dropped to zero when paused and "Paused" displayed below timer.
   Unit passed test.
2. No waveform or considerably different waveform.
   Unit failed test. Replace appropriate Stim Board.
3. Amplitude failed to "zero" when paused.
   Unit failed test. Replace appropriate Stim Board.
4. "Paused" did not display when unit paused.
   Unit failed test. Replace appropriate Stim Board.

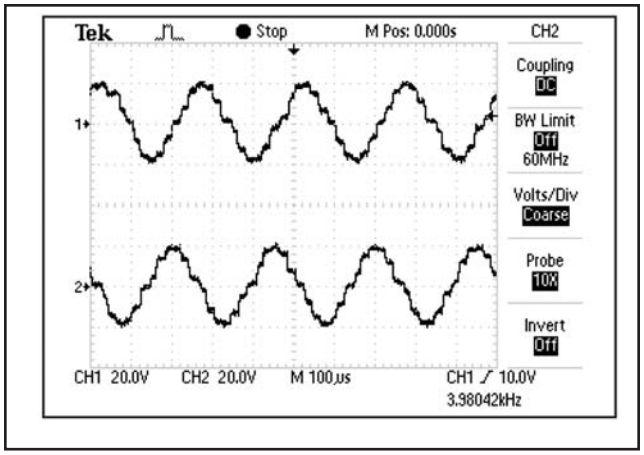


FIGURE 5.5

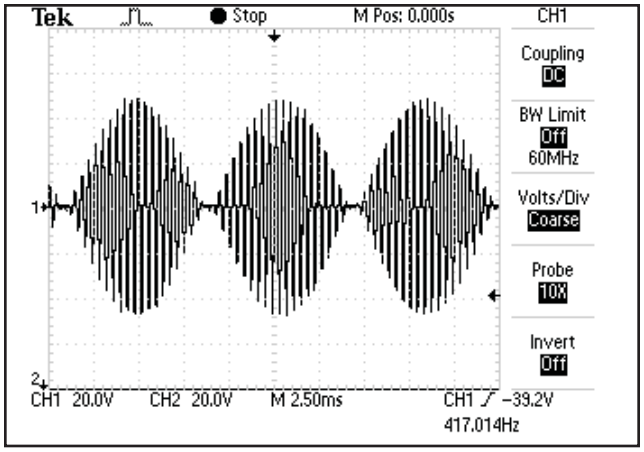


FIGURE 5.6

5.9 PREMODULATED MODE TEST

Set up System per **5.7 parts A and B** prior to performing test.

A. Premodulated Mode Test Procedures

1. Set Scope; Time- 2.50 mS, Channel- 20 V, and Trigger- DC
2. Highlight Stim Channel 1. Press the Enter button.
3. Highlight Premod. Press the Enter button.
4. Increase Intensity until 50 is displayed.
5. Press START button.
6. Compare waveform on scope to **Figure 5.6.**
7. Press STOP button.
8. Highlight Channel 2 and repeat steps 3 through 7.

B. Premodulated Mode Test Results

1. Waveform is the same between scope and **Figure 5.6.**
   Unit passed test.

5.10 RUSSIAN MODE TEST

Set up System per **5.7 parts A and B** prior to performing test.

A. Russian Mode Test Procedures

1. Set Scope; Time- 5 mS, Channel- 50 V, and Trigger- DC
3. Highlight Stim Channel 1. Press Enter button.
4. Highlight Russian. Press Enter button.
5. Highlight Channel Mode. Press the Enter button until Co-Contract is displayed.
6. Highlight Cycle Time. Press the Enter button.
7. Highlight Continuous. Press the Enter button.
8. Increase Intensity until 100 is displayed.
9. Press START button.
10. Compare waveform on scope to **Figure 5.7.**
11. Verify that both Channels reach 100.
12. Press STOP button.
13. Highlight Channel 2 and repeat steps 4 through 12.

B. Russian Mode Test Results

1. Waveform is the same between scope and **Figure 5.7** and amplitude reached 100 volts peak.

   Unit passed test.
2. No waveform or considerably different waveform.

   Unit failed test. Replace appropriate Stim Board.
3. Amplitude failed to reach 100 volts peak on both Channels.

   Unit failed test. Replace appropriate Stim Board.

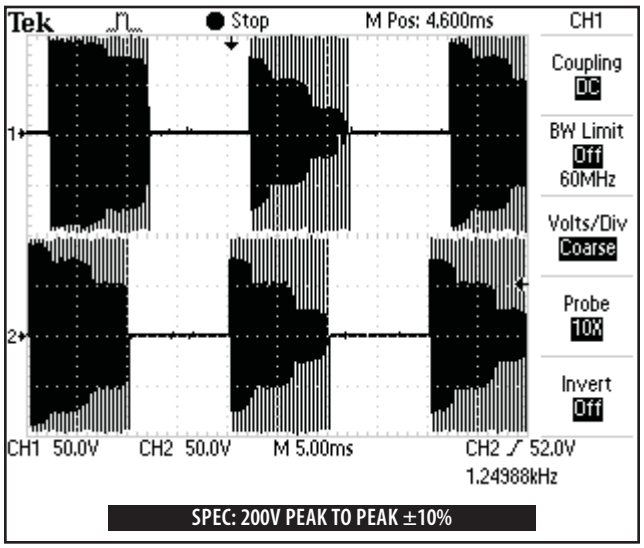


FIGURE 5.7

5.11 HIGH VOLTAGE PULSED CURRENT (HVPC) MODE TEST

Set up unit per **5.7 parts A and B** prior to performing tests.

A. High Voltage Pulsed Current (HVPC) Mode Test Procedures

1. Set Scope; Time- 25 µS, Channel- 50 V, and Trigger- DC
2. Highlight Stim Channel 1. Press the Enter button.
3. Highlight High Volt. Press the Enter button.
4. Increase Intensity until 250 V is displayed.
5. Highlight Display and press the Enter button until Peak Current is displayed. Press the Enter button.
6. Press START button.
7. Compare waveform on scope to **Figure 5.8.**
8. Highlight Polarity. Press the Enter button until Positive is displayed.
9. Compare waveform form on scope to **Figure 5.9**.
10. The numbers displayed for amplitude must not exceed 1.5 Amps. **See Figure 5.10.**
11. Press STOP button.
12. Highlight Channel 2.
13. Press the Enter button and repeat steps 3 through 12.

B. High Voltage Pulsed Current (HVPC) Mode Test Results

1. Waveforms on scope the same as **Figures 5.8 and 5.9.** Amps do not exceed 1.5.

   Unit passed test.
2. No waveform or considerably different waveforms.

   Unit failed test. Replace appropriate Stim Board.
3. Amps exceed 1.5.

   Unit failed test. Replace appropriate Stim Board.

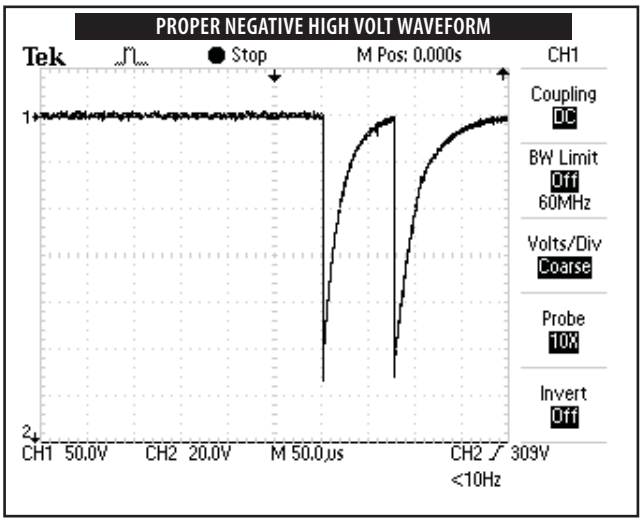


FIGURE 5.8

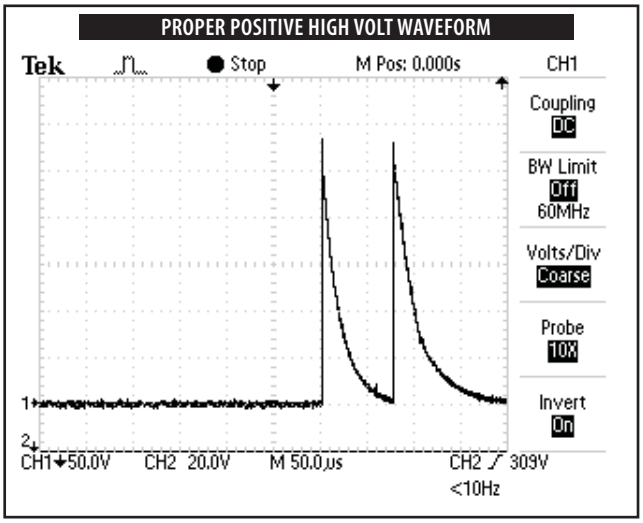


FIGURE 5.9

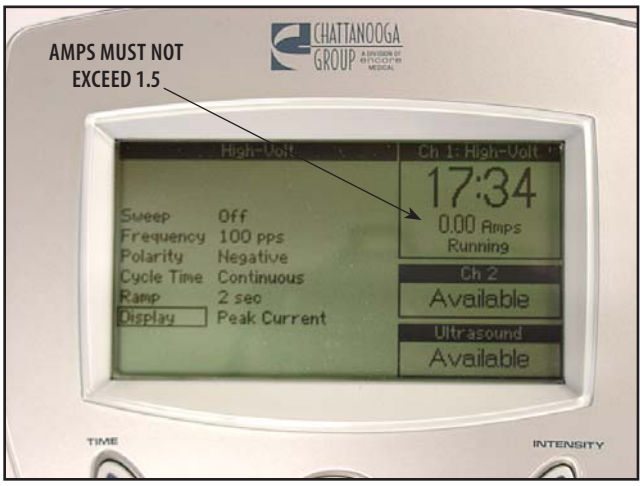


FIGURE 5.10

5.12 ULTRASOUND TESTS

Equipment Required for 5.13 and 5.14

- Degassed Water. **Refer to page 16** for Degassed Water Recipes.
- Ohmic Instruments DT 100 UPM or DT 10 Ultrasound Power Meter.
- Dissolved Oxygen Test Kit. Used to test oxygen level of degassed water.
- Intelect Transport Combo Applicator.

5.13 ULTRASOUND APPLICATOR IDENTIFICATION TEST

NOTE:
Use any Intelect Transport Combo Applicator for this test.

A. Ultrasound Applicator Identification Test Procedures

1. Without Ultrasound Applicator installed, turn unit on.
2. View the Ultrasound channel in the lower right corner of screen. It should read "Unplugged". **See Figure 5.11.**
3. Connect Ultrasound Applicator into Applicator receptacle. **See Figure 5.12.** Watch Applicator LED while connecting to system. The LED should flash Green five times.
4. Look at the Ultrasound channel. It should read Available. **See Figure 5.12.**
5. Highlight Ultrasound. Press the Enter button.
6. Highlight Warming. Press the Enter button until On is displayed beside Warming.
7. Press the Back button. Turn System Off and back On with Main Power Switch. After System boots, view the Ultrasound channel, Warming should be visible. **See Figure 5.13.**

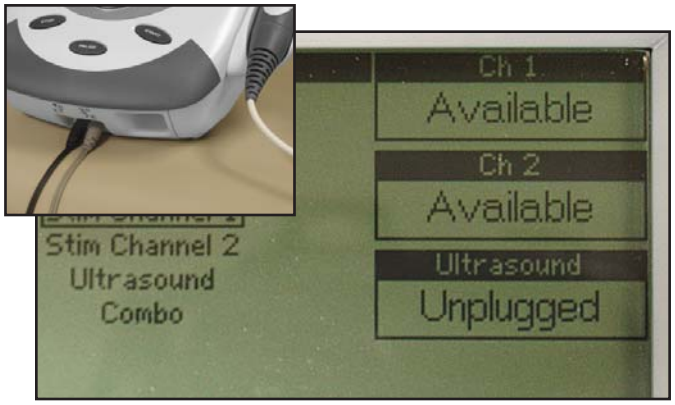


FIGURE 5.11

FIGURE 5.12

FIGURE 5.13

5.13 ULTRASOUND APPLICATOR IDENTIFICATION TEST (CONTINUED)

B. Ultrasound Applicator Identification Test Results

1. Unit operates as described in **steps 2, 4, and 7.**

   Unit passed test.

2. "No Cal.", displays in Ultrasound channel.

   a) Applicator not calibrated or needs recalibration.

   b) Possible bad Applicator. Retest with known good Applicator.

3. Unplugged displays after ten seconds of Applicator being connected to System.

   a) Possible bad applicator. Retest with known good Applicator.

   b) Possible bad internal connection at Ultrasound Board.

   c) Possible bad Ultrasound Board.

   d) Possible bad Control Board.

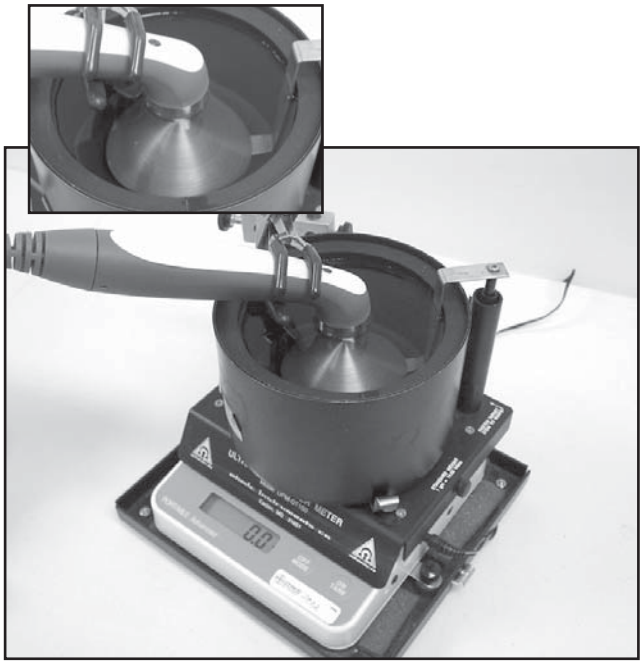


FIGURE 5.14

5.14 ULTRASOUND APPLICATOR OUTPUT TEST

Perform this test using all available Intelect Transport Combo Applicators used with the System being tested.

A. Ultrasound Applicator Output Test Procedures

1. Set up Ohmic Instruments DT 100 or UPM DT 10 Ultrasound Power Meter per Operator's Instructions and fill test reservoir with Degassed Water.
2. Place an Applicator into the Power Meter retainer. Make certain the Sound Head is completely submerged in the degassed water and centered directly over the Stainless Steel Cone. **See Figure 5.14.**
3. Zero or Tare meter.
4. Highlight Ultrasound. Press the Enter button.
5. Highlight Duty Cycle. Press the Enter button. Highlight Continuous and press the Enter button.
6. Highlight Display. Press the Enter button until Watts displays.
7. Press START button.

NOTE:
The position of the Sound Head over the stainless steel cone is critical to the test results. The Sound Head must be level and centered.

5.14 ULTRASOUND APPLICATOR OUTPUT TEST (CONTINUED)

⚠ WARNING

Use only Degassed Water in Power Meter for testing Ultrasound Applicators. Use of other types of water will cause false test results. **Refer to page 16** for Degassed Water Recipes.

Do not aerate water when filling Power Meter.

8. Increase Intensity until the appropriate Watts is displayed per **Figure 5.15.**
9. Compare Power Meter readings to **Figure 5.15** to all settings for the respective Applicator being tested as shown in **Figure 5.15.**
10. Press Frequency button until 3.3 MHz is displayed within the Frequency icon. Repeat test and compare readings to **Figure 5.15.**

NOTE:
The Applicator LED should constantly illuminate green during the Applicator Output tests.

B. Ultrasound Applicator Output Test Results

1. Output ranges fall within the specified ranges as listed in **Figure 5.15.**

   Unit passed test.

2. Readings fall outside specified ranges of **Figure 5.15.**

   a) Possible bad Degassed Water in Power Meter.

   b) Possible use of Power Meter other than Ohmic Instruments DT 100 or UPM DT 10 Ultrasound Power Meter.

   c). Sound Head not leveled and centered over cone in power meter.

   d) Possible bad or out of calibration Applicator.

   e) Use known good Applicator.

   f) Check Ultrasound Board internal connections.

   g) Replace Ultrasound Board.

   h) Replace Control Board.

APPLICATOR OUTPUT SPECIFICATIONS

APPLICATOR SIZE	POWER SETTING (WATTS)	OUTPUT RANGE
1 cm^2	1*	0.8 - 1.2
	2*	1.6 - 2.4
2 cm^2	1	0.8 - 1.2
	2	1.6 - 2.4
	4	3.2 - 4.8
5 cm^2	1	0.8 - 1.2
	2	1.6 - 2.4
	5	4.0 - 6.0
	10	8.0 - 12.0
10 cm^2	1	0.8 - 1.2
	5	4.0 - 6.0
	10	8.0 - 12.0
	15**	12.0 - 18.0
	20**	16.0 - 24.0

* 3.3 MHz Only

**1.0 MHz Only

FIGURE 5.15

5.15 ULTRASOUND DUTY CYCLE TEST

This test is performed using only the 5 cm^2 Intelect Transport Combo Applicator.

A. Ultrasound Duty Cycle Test Procedures

1. Set up Ohmic Instruments DT 100 or UPM DT 10 Ultrasound Power Meter per Operator's Instructions and fill test reservoir with Degassed Water.

⚠ WARNING

Use only Degassed Water in Power Meter for testing Ultrasound Applicators. Use of other types of water will cause false test results. **Refer to page 16** for Degassed Water Recipes.

Do not aerate water when filling Power Meter.

2. Place the 5 cm^2 Applicator into the Power Meter retainer. Make certain the Sound Head is completely submerged in the degassed water and centered directly over the Stainless Steel Cone. **See Figure 5.16.**
3. Zero or Tare meter.
4. Highlight Ultrasound on system. Press the Enter button.
5. Highlight Duty Cycle. Highlight Continuous and press the Enter button.
6. Highlight Display. Press the Enter button until Watts appears beside Display.
7. Press START button.
8. Increase Intensity until the appropriate Watts is displayed. **See Figure 5.17.**
9. Compare Power Meter reading to **Figure 5.17.**
10. Press the STOP button.
11. Highlight Duty Cycle and press the Enter button. Highlight the next level of Duty Cycle and repeat **steps 6 through 10**. Repeat for remaining Duty Cycle levels.
12. Highlight Frequency. Press the Enter button until 3.3 MHz is displayed beside Frequency. Repeat **steps 4 through 11**.

FIGURE 5.16

DUTY CYCLE SPECIFICATIONS		
APPLICATOR SIZE	**DUTY CYCLE**	**OUTPUT RANGE**
1 cm^2 at 2.7 Watts Continuous	10%	0.2 - 0.3
	20%	0.4 - 0.7
	50%	1.1 - 1.6
2 cm^2 at 5.4 Watts Continuous	10%	0.2 - 0.3
	20%	0.9 1.3
	50%	2.2 - 3.2
5 cm^2 at 12 Watts Continuous	10%	1.0 - 1.4
	20%	1.9 - 2.9
	50%	4.8 - 7.2
10 cm^2 at 20 Watts Continuous Operating at 1mHz	10%	1.6 - 2.4
	20%	3.2 - 4.8
	50%	8.0 - 12.0
10 cm^2 at 10 Watts Continuous Operating at 3.3mHz	10%	0.8 - 1.2
	20%	1.6 - 2.4
	50%	4.0 - 6.0

FIGURE 5.17

5.15 ULTRASOUND DUTY CYCLE TEST (CONTINUED)

B. Ultrasound Duty Cycle Test Results

1. Duty Cycles fall within the specified ranges as listed in **Figure 5.17.**

   Unit passed test.

2. Readings fall outside specified ranges of **Figure 5.17.**

   a) Possible bad degassed water in Power Meter.

   b) Possible use of Power Meter other than Ohmic Instruments DT 100 or UPM DT 10 Ultrasound Power Meter.

   c) Possible bad or out of calibration Applicator. Retest with known good Intelect Transport Applicator.

   d) Possible bad internal connection at Ultrasound Board.

   e) Replace possible bad Ultrasound Board.

   f) Replace possible bad Control Board.

5.16 COMBO OPERATION TEST

This test is performed using the 5 cm² Applicator.

Highlight Channel 1 and set up system per **5.6 parts A and B** prior to performing tests.

Connect the Intelect Transport 5 cm² Applicator to the System. **See Figure 5.18**.
Applicator LED will flash green five times.

A. Combo Operation Test Procedures

1. Highlight Combo. Press the Enter button.
2. Highlight Display. Press the Enter button until Watts is displayed beside Display.
3. Highlight Waveform. Press the Enter button.
4. Press the Up or Down Arrow button until IFC is highlighted. Press the Enter button.
5. Highlight Edit Stim. Press the Enter button. Increase Intensity until Channel 1 reads 50 mA.
7. Press START button.
8. Touch the Ultrasound Applicator to the Combo Contact on the ESTI-2 Load Test Box. The Combo Indicator on the ESTI-2 should illuminate. **See Figure 5.19.**

B. Combo Operation Test Results

1. Combo Indicator light illuminates.

   Unit passed test.

2. Combo Indicator light does not illuminate.

   Unit failed test.

   Replace Channel 1 Stim Board.

FIGURE 5.18

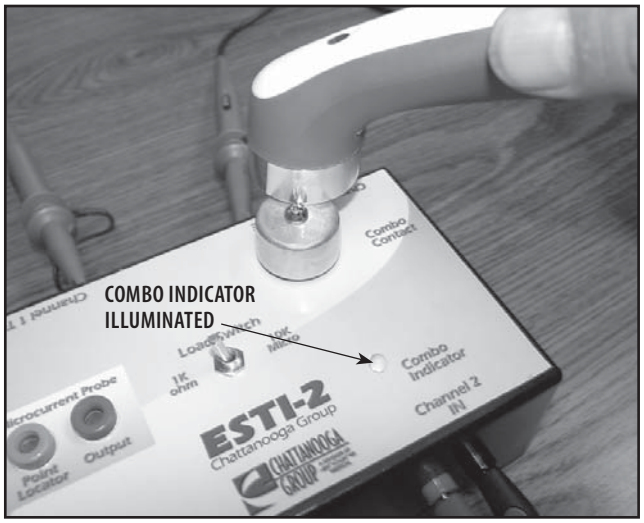


FIGURE 5.19

6- REMOVAL & REPLACEMENT

6.1 SEPARATING TOP & BOTTOM

⚠ WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

A. Part Numbers

Top 27552
Base 27983

B. Tools & Equipment Required

- #1 Phillips Screwdriver
- Flat Blade Screwdriver

C. Removing Top from Bottom

1. Place system face down on a soft work surface.
2. Remove Lower Front Feet and Rear Fan Grill. Use a Flat Blade Screwdriver to gently pry the Fan Grill free. **See Figure 6.1.**
3. Using a #1 Phillips remove the four mounting screws securing the Top and Bottom together. **See Figure 6.2.**
4. Turn system over on its feet and carefully separate the System Top from the Bottom Housing.
5. Raise the system Top and disconnect the Fan, Power Supply, and Battery Harnesses from the Control Board. **See Figure 6.3.**
6. Put the unit back together by reversing **steps 1 through 5**.

   NOTE:
   When assembling the unit, tuck the Ferrite Bead between the power supply and the case. **See Figure 6.3**

FIGURE 6.1

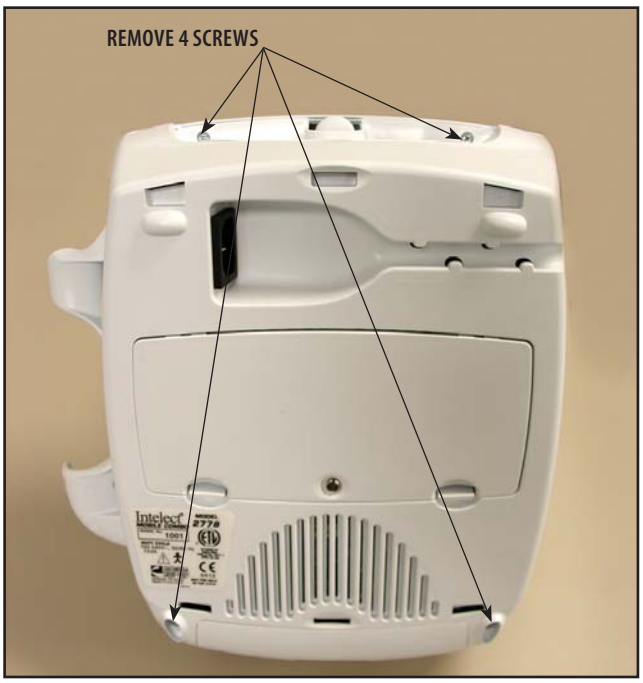


FIGURE 6.2

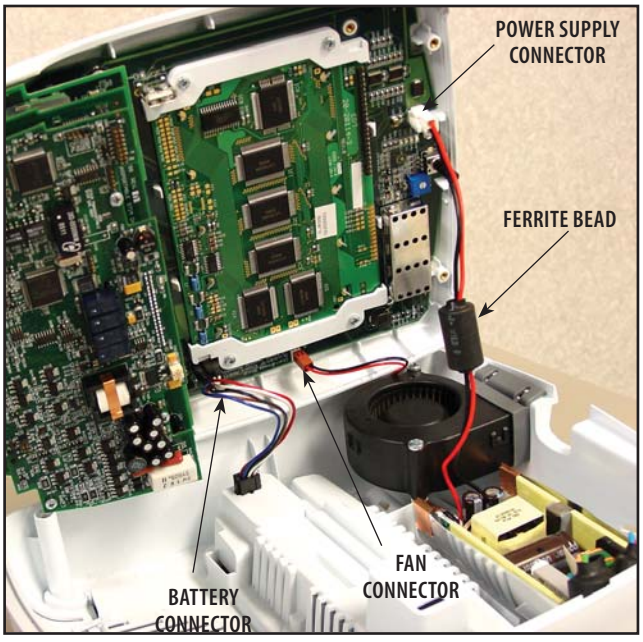


FIGURE 6.3

6.2 THERAPY SYSTEM FAN

⚠ WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

A. Part Number 27158

B. Tools and Equipment Required

- #2 Phillips Screwdriver

C. System Fan

1. Separate Top from Bottom. **Refer to 6.1, part C**.
2. Using a #2 Phillips Screwdriver, remove the two Fan Retaining Screws securing the Fan to the system Bottom. **See Figure 6.4.**
3. Remove the Fan Baffle from the Fan Housing. **See Figure 6.5.**
4. Replace the Fan by reversing **steps 1 through 3.**

NOTE:
Do not over tighten the screws. Over tightening will damage the threads of the brass standoffs.

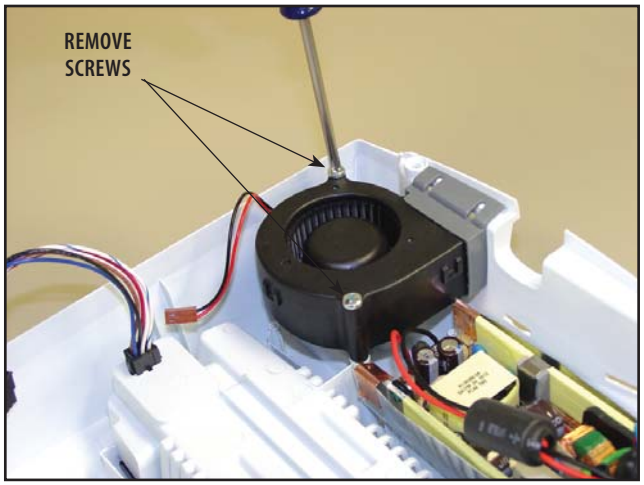


FIGURE 6.4

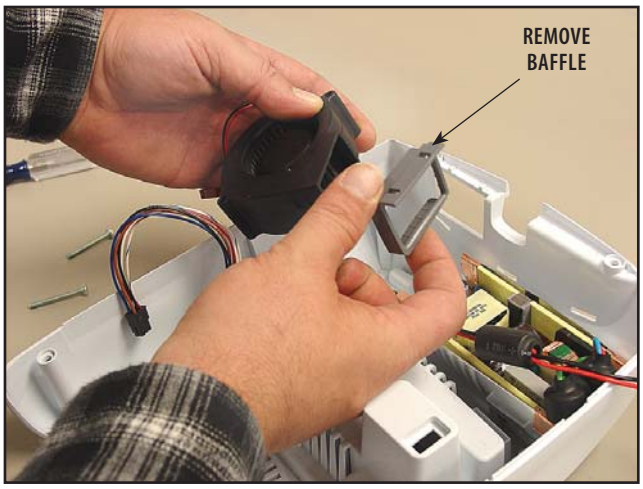


FIGURE 6.5

6.3 POWER SUPPLY

⚠ WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

A. Part Number 27265

B. Tools and Equipment Required

- #1 Phillips Screwdriver
- Insulated Needle Nose Pliers
- Digital Multi Meter
- 10k Resistor
- 1/2 inch Copper Tape

C. Power Supply

1. Separate Top from Bottom. **Refer to 6.1, part C.**
2. Using the # 1 Phillips Screwdriver, remove the two screws securing the Power Supply to the system Bottom. **See Figure 6.6.**

⚠ DANGER

POWER SUPPLIES RETAIN HIGH VOLTAGE! WHEN REMOVING FROM SYSTEM, HANDLE POWER SUPPLIES BY MOUNTING BRACKETS ONLY.

3. Lift Power Supply Assembly up to remove from mounting tabs. **See Figure 6.7.**
4. Discharge the 400V Capacitor by wrapping a 10k resistor around the probes of a Multi meter. Touch the leads of the Mulit meter to the prongs on the capacitor to discard. **See Figure 6.8.**
5. Watch the Multi meter to verify that the voltage across the capacitor discharges close to zero volts DC.

⚠ WARNING

- When replacing the shield on the Power Supply. Verify that the foil (CONDUCTIVE SIDE) of the shield faces out and does not come in contact with the components of the Power Supply.
- When installing the shield on the Power Supply make certain that the shield does not get caught on the Power Supply guide posts. **See Figure 6.7**

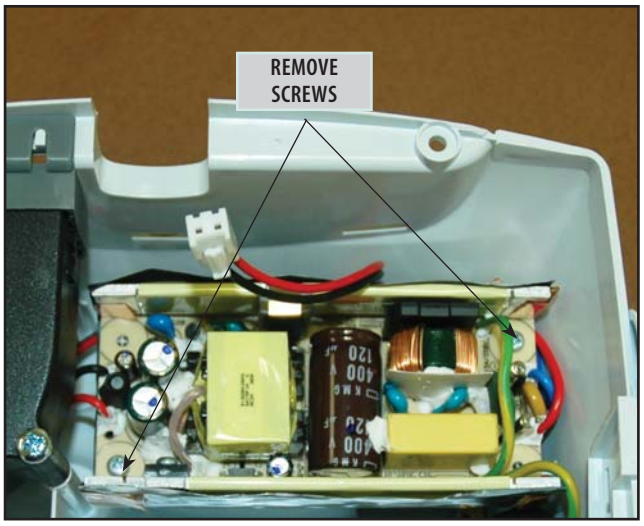


FIGURE 6.6

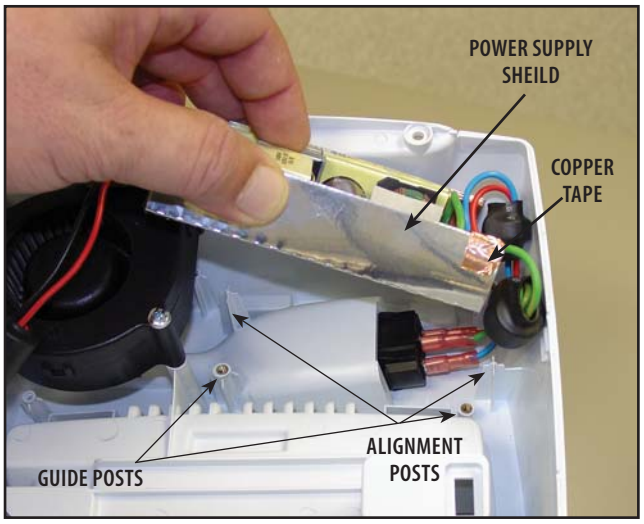


FIGURE 6.7

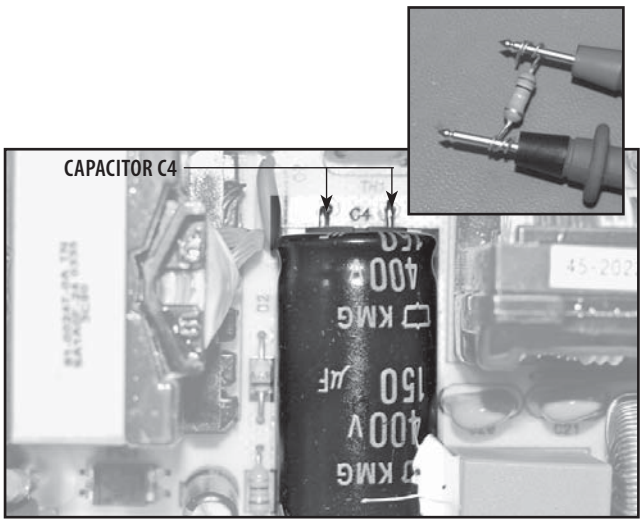


FIGURE 6.8

6.3 POWER SUPPLY (CONTINUED)

⚠ WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

6. Using Insulated Needle Nose Pliers, disconnect the Power Supply Harnesses from the Mains Connector. **See Figure 6.9.**
7. Remove Power Supply from system.
8. Remove the Power Supply Shield.
9. Remove the Copper Tape from the shield. **See Figure 6.7.**
10. Replace the Power Supply by reversing **steps 1 through 5**.

NOTE:
Apply new 1/2 Copper Tape, part number 28152 to replace the tape removed in **Step 8** of this procedure.

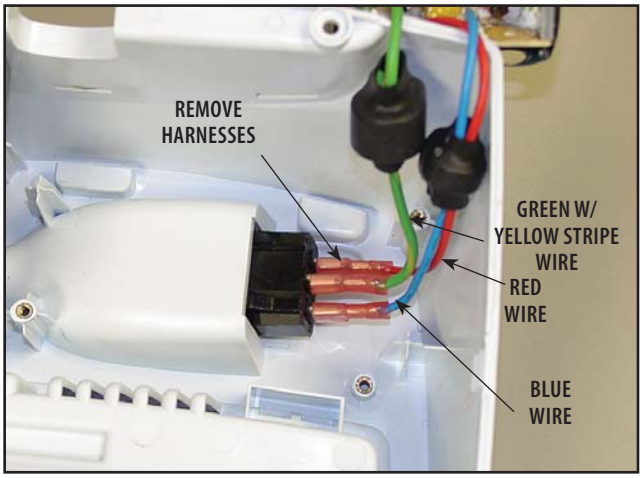


FIGURE 6.9

⚠ WARNING

When replacing the shield on the Power Supply. Verify that the foil (CONDUCTIVE SIDE) of the shield faces out and does not come in contact with the components of the Power Supply.

6.4 CHANNEL 1 STIM BOARD

⚠ WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

A. Part Number..... 27419

B. Tools and Equipment Required

- #1 Phillips Screwdriver

C. Channel 1 Stim Board

1. Separate Top from Bottom. **Refer to 6.1, part C.**
2. Using the # 1 Phillips Screwdriver, remove the four screws securing Channel 1 Stim Board to the Stand Offs. **See Figure 6.10.**
3. Carefully lift the Channel 1 Stim Board from the unit. Make certain not to bend any of the Header Connector Pins on the board below during removal. **See Figure 6.11.**
4. Replace Channel 1 Stim Board in reverse order of preceding steps. Make certain all Header Connector Pins are properly engaged. **See Figure 6.11.**

   NOTE:
   Do not over tighten the screws. Over tightening will damage the threads of the brass inserts and Stand Offs.

⚠ WARNING

Care must be taken during removal and replacement with the Header Pins. Bending the Header Pins may cause the unit to fail.

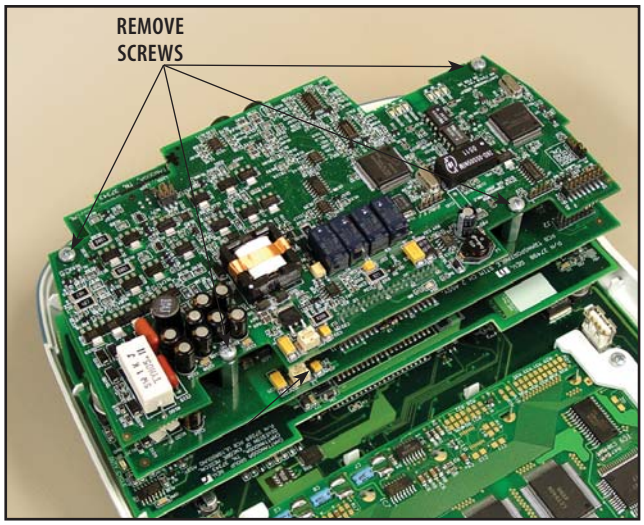


FIGURE 6.10

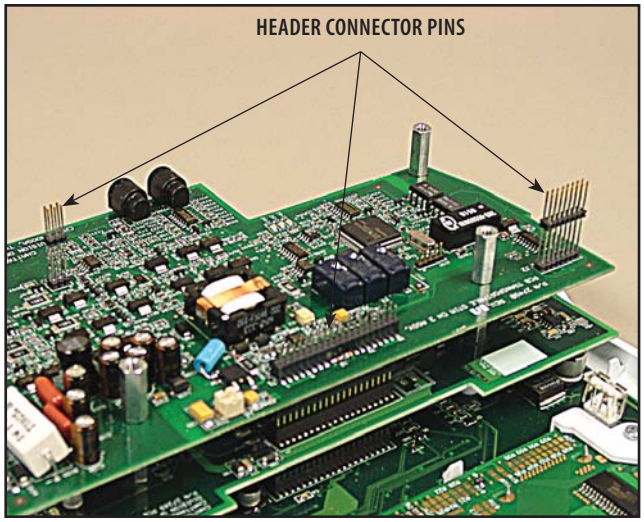


FIGURE 6.11

6.5 CHANNEL 2 STIM BOARD

⚠ WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

A. Part Number..... 27498

B. Tools and Equipment Required

- #1 Phillips Screwdriver
- 1/4" Nut Driver or Wrench

C. Channel 2 Stim Board Removal

1. Separate Top from Bottom. **Refer to 6.1, part C.**
2. Remove Channel 1 Stim Board. **Refer to 6.4, part C**.
3. Using the 1/4" Nut Driver, remove the four Stand Offs securing Channel 2 Stim Board in place. **See Figure 6.12.**
4. Remove the 40 Pin Header from the back of the Channel 2 Stim Board. **See Figure 6.13.**
5. Install 40 Pin Header to back of new Channel 2 Stim Board. Make certain it is completely seated against board. **See Figure 6.13.**
6. Position the Channel 2 Stim Board over the Ultrasound Board aligning the 40 Pin Header with the 40 Pin Connector. **See Figure 6.14.**
7. Press the Channel 2 Stim Board into position until the board rests against the Ultrasound Board Stand Offs.
8. Secure the Channel 2 Stim Board using the Stand Offs removed in **part C, step 3** above.
9. Install the Channel 1 Stim Board. **Refer to 6.4, part C.**
10. Re-assemble Top to Bottom. **Refer to 6.1, part C.**

NOTE:
Do not over tighten the Stand Offs or Screws. Over tightening will damage the threads of the Brass Inserts and Stand Offs.

⚠ WARNING

Care must be taken during removal and replacement with the Header Pins. Bending the Header Pins may cause the unit to fail.

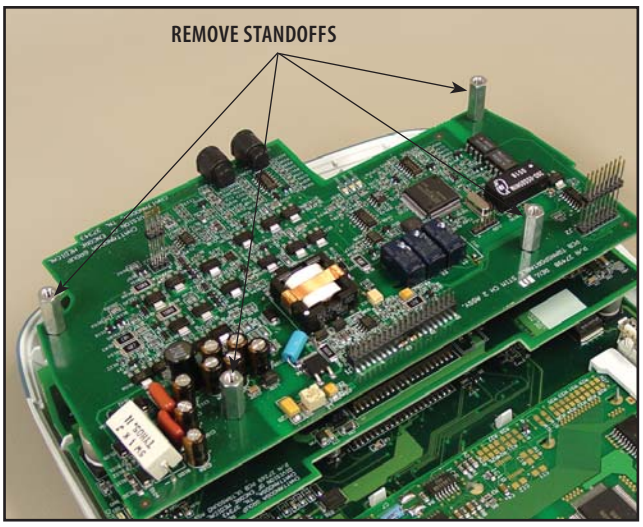


FIGURE 6.12

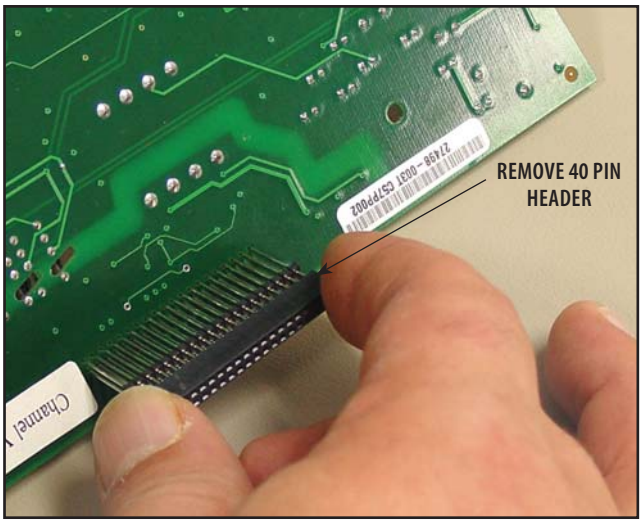


FIGURE 6.13

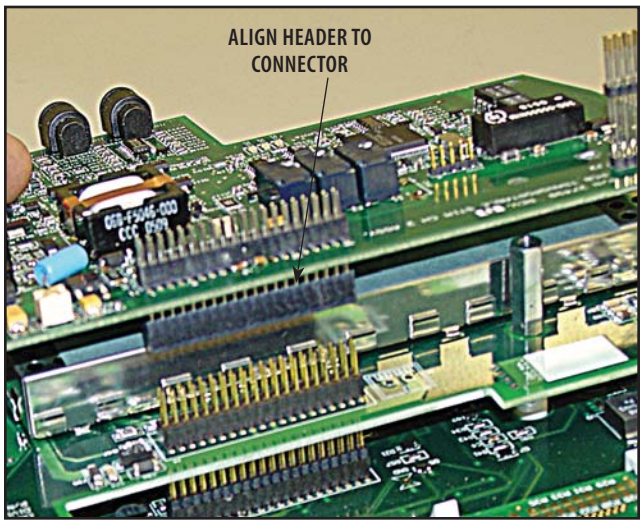


FIGURE 6.15

6.6 ULTRASOUND BOARD

WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

A. Part Number..... 27269

B. Tools and Equipment Required

- #1 Phillips Screwdriver
- 1/4" Nut Driver or Wrench

C. Ultrasound Board

1. Separate Top from Bottom. **Refer to 6.1, part C.**
2. Remove Channel 1 Stim Board. **Refer to 6.4, part C.**
3. Remove Channel 2 Stim Board. **Refer to 6.5, part C.**
4. Using the 1/4" Nut Driver, remove the four Stand Offs securing Ultrasound Board in place. **See Figure 6.15.**
5. Carefully remove the Ultrasound Board. **See Figure 6.16.**

   NOTE:
   Headers may stay on the board being removed or on the connector. If the header stays with the connector, remove and install on the replacement board.
6. Remove the 40 Pin Header from the Ultrasound Board or the connector. **See Figure 6.16.**
7. Install 40 Pin Header to back of new Ultrasound Board. Make certain it is completely seated against board. **See Figure 6.17**.
8. Position the Ultrasound Board over the Control Board aligning the 40 Pin Header with the 40 Pin Connector on Control Board. **See Figure 6.16.**
9. Press the Ultrasound Board into position until the board rests against the Control Board Stand Offs. Verify that it is well seated by pushing on the sides of the connector.
10. Secure the Ultrasound Board using the Stand Offs removed in **part B, step 4** above.
11. Reassemble by reversing **steps 1 through 3**.

WARNING

Care must be taken during removal and replacement with the Header Pins. Bending the Header Pins may cause the unit to fail.

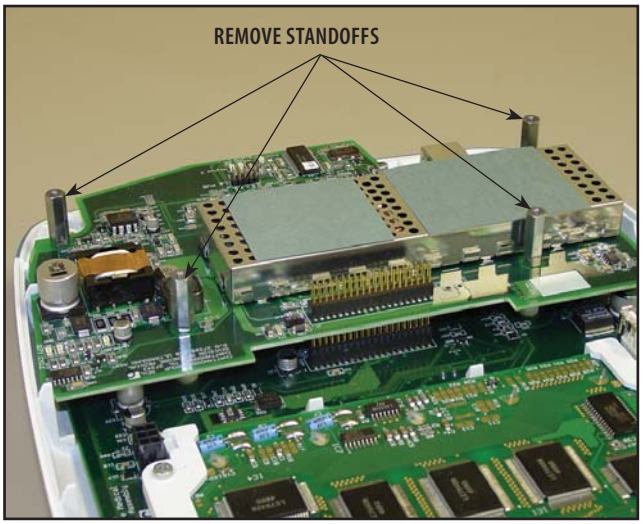


FIGURE 6.15

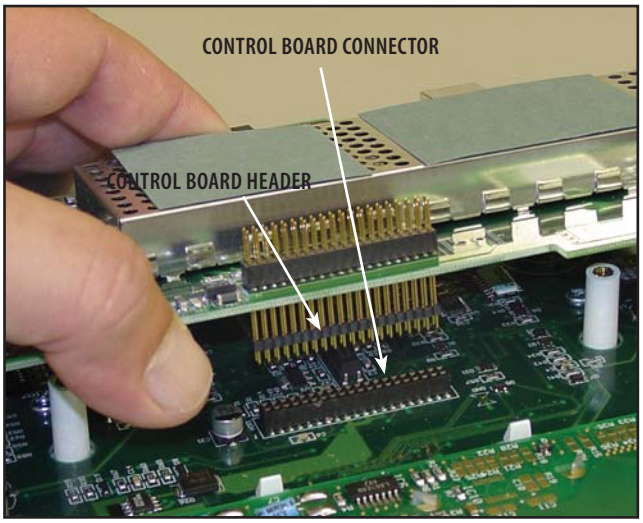


FIGURE 6.16

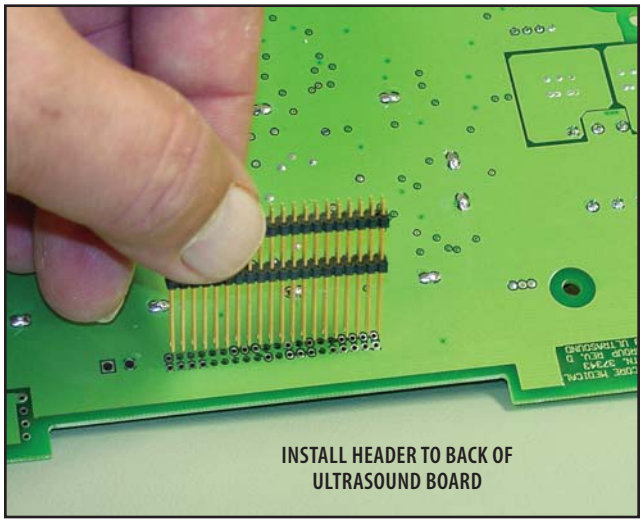


FIGURE 6.17

6.7 CONTROL BOARD ASSEMBLY

⚠ WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

A. Part Number..... 27249

B. Tools and Equipment Required

- #1 Phillips Screwdriver
- 1/4" Nut Driver or Wrench

C. Control Board Replacement

1. Separate Top from Bottom. **Refer to 6.1, part C.**
2. Remove Channel 1 Stim Board. **Refer to 6.4, part C.**
3. Remove Channel 2 Stim Board. **Refer to 6.5, part C.**
4. Remove Ultrasound Board, **Refer to 6.6, part C.**
5. Remove the Contrast Control Knob. **See Figure 6.18.**
6. Remove the seven screws securing the Control Board Assembly in position. **See Figure 6.19.**
7. Remove the four LCD Bracket Mounting Screws. **See Figure 6.21.**
8. While lifting on the lower end of the Control Board Assembly with one hand, release the four Tabs securing the Control Board with the other, to remove the Control Board from the system Top. Two of the Tabs are located above the LCD and two below. **See Figures 6.19 and 6.20.**

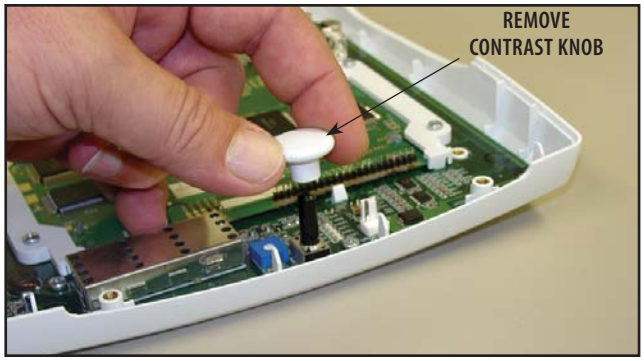


FIGURE 6.18

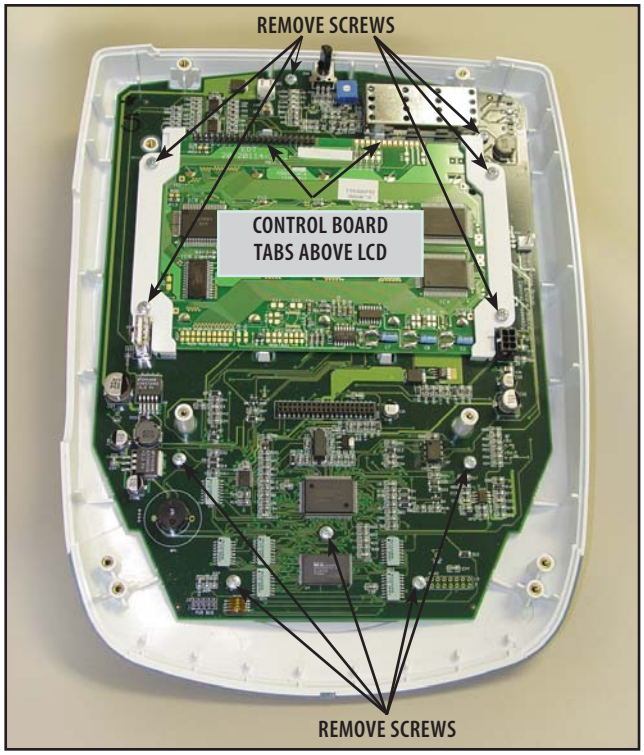


FIGURE 6.19

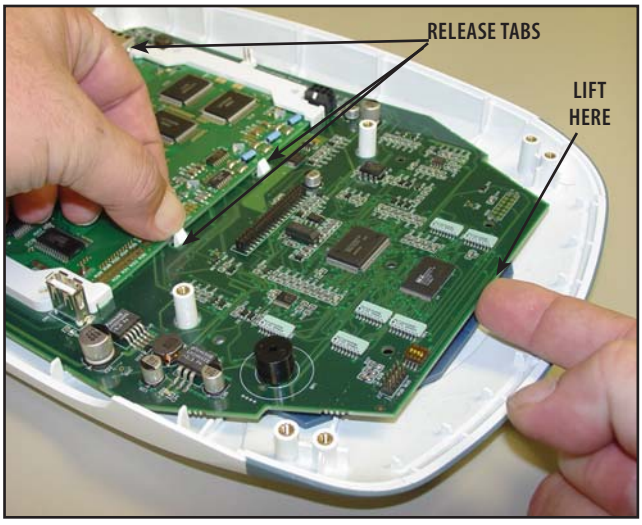


FIGURE 6.20

6.7 CONTROL BOARD ASSEMBLY (CONTINUED)

9. On the back side of the Control Board, press down and back on the four LCD tabs and push back through the Control Board. **See Figure 6.21.**
10. On the front side of the Control Board, pull the LCD up to release the header from the board. **See Figure 6.22.**
11. Position the new Control Board Assembly over the Alignment Tabs of the system Top. Press the Control Board Assembly until the Alignment Tabs lock the Control Board into position.
12. Reverse **steps 1 through 10** to install the replacement Control Board.

NOTE:
Do not over tighten the Stand Offs or screws. Over tightening will damage the threads of the brass inserts and Stand Offs.

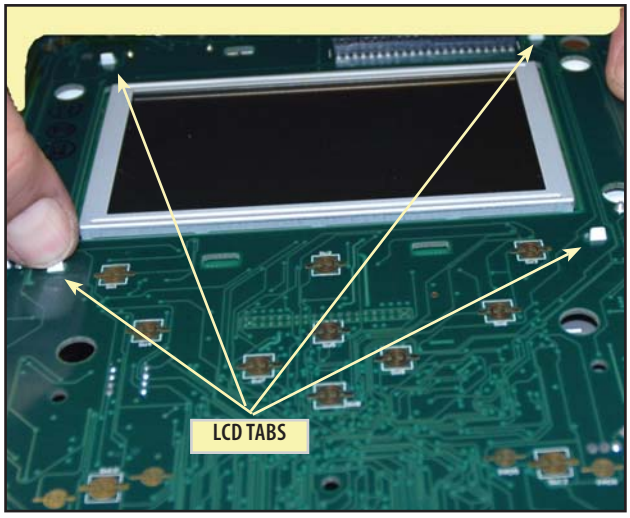


FIGURE 6.21

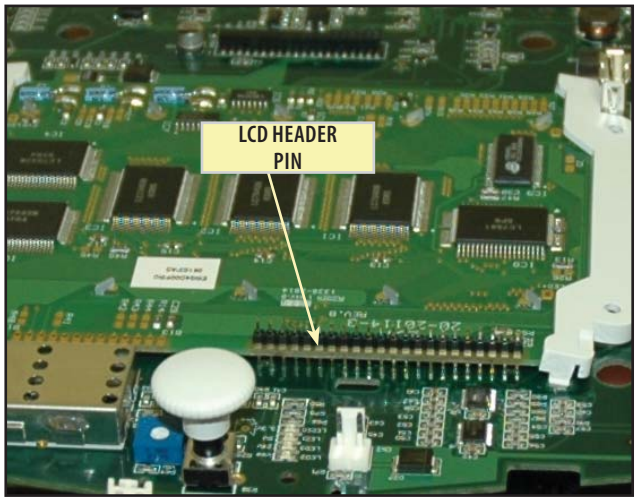


FIGURE 6.22

6.8 LCD

A. Part Number..... 27249

B. Tools and Equipment Required

- #1 Phillips Screwdriver
- 1/4" Nut Driver or Wrench

C. LCD Replacement

1. Separate Top from Bottom. **Refer to 6.1, part C.**
2. Remove Channel 1 Stim Board. **Refer to 6.4, part C.**
3. Remove Channel 2 Stim Board. **Refer to 6.5, part C.**
4. Remove Ultrasound Board, **Refer to 6.6, part C.**
5. Remove Control Board, **Refer to 6.7, part C steps 1 through 10.**
6. Once the LCD is removed from the Control Board, **per step 5,** remove the LCD mounting bracket from both sides of the LCD. **See Figure 6.23.**
7. Replace the LCD by reversing the steps above.

NOTE:
Always install the LCD Brackets prior to attaching the LCD to the Control Board.

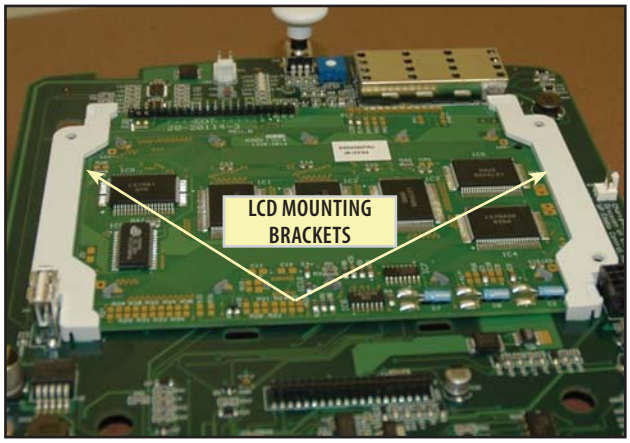


FIGURE 6.23

6.9 KEYMAT, ON/OFF BUTTON, OR UNIT TOP

⚠ WARNING

Unplug the unit from the power source before attempting removal or replacement procedures to prevent electrical shock.

A. Part Number

Keymat and On/Off Button 27560

B. Tools and Equipment Required

- #1 Phillips Screwdriver
- 1/4 in Wrench

B. Keymat Assembly Removal

1. Separate Top from Bottom. **Refer to 6.1, part C.**
2. Remove Channel 1 Stim Board. **Refer to 6.4, part C.**
3. Remove Channel 2 Stim Board. **Refer to 6.5, part C.**
4. Remove Ultrasound Board. **Refer to 6.6, part C.**
5. Remove Control Board Assembly. **Refer to 6.7, part C.**
6. Lift out Keymat Assembly or On/Off Button Keymat. **See Figure 6.24.**
7. Replace the Keymat by reversing **steps 1 through 6.**

NOTE:
Do not over tighten the Stand Offs or screws. Over tightening will damage the threads of the brass inserts and Stand Offs.

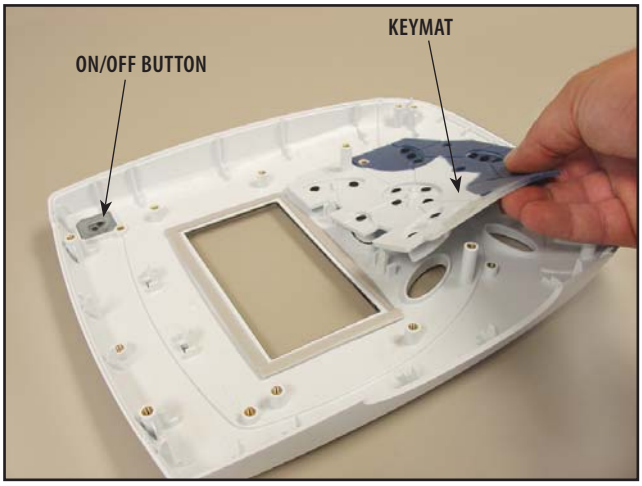


FIGURE 6.24

6.10 PLYNTH

A. Part Number

Plynth 27253

B. Tools and Equipment Required

- None

B. Plynth Removal

NOTE:

The plynth is secured to the unit by tabs that fit into the five slots shown in **Figure 6.25**.

1. Remove the Plynth by applying pressure to center of the top or wide part of the Plynth. When pressing lift the Plynth out the three slots at the top and then remove the Plynth from the two slots at the bottom. **Refer to 6.26.**
7. Replace the Plynth by reversing this procedure.

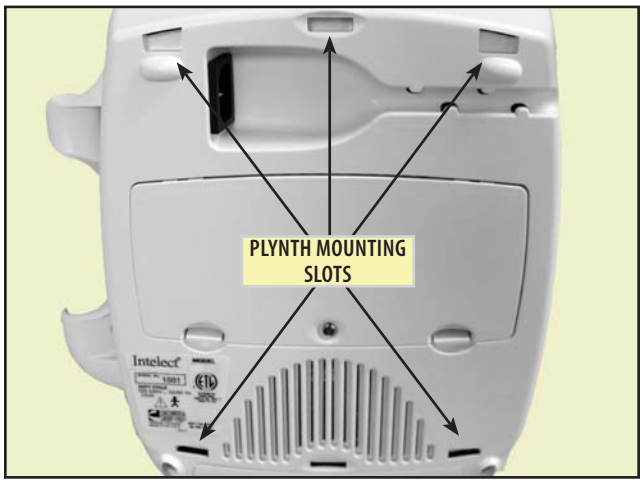


FIGURE 6.25

FIGURE 6.26

7.1 CLEANING THE SYSTEM

A. Cleaning the Therapy System

With the system disconnected from the power source, clean the system with a clean, lint free cloth moistened with water and mild antibacterial soap. If a more sterile cleaning is needed, use a cloth moistened with an antimicrobial cleaner.

Do not submerse the system in liquids. Should the unit accidentally become submersed, contact the dealer or Chattanooga Group Service Department immediately. Do not attempt to use a system that has been wet inside until inspected and tested by a Service Technician Certified by Chattanooga Group.

Do not allow liquids to enter the ventilation holes in the optional modules. This could permanently damage the modules.

B. Cleaning Therapy System Lens

Clean the Therapy System Lens with the NOVUS® Plastic Polishing System. NOVUS can be purchased by going to www.novuspolish.com on the internet. Follow the instructions as given by NOVUS on their product.

Do Not Use alcohol or chlorine based solvents as this may damage the lens.

7.2 CALIBRATION REQUIREMENTS

Ultrasound Applicators:

Annual calibration is required for all Ultrasound Applicators. Only the Applicators should be sent to the factory or a Field Technician certified by Chattanooga Group for this procedure.

7.3 FIELD SERVICE

A. All field service procedures as described in this Service Manual must be performed by a Service Technician certified by Chattanooga Group.

B. Any attempted outside the scope of this Service Manual is the sole responsibility and liability of the Field Technician performing such procedures.

C. After the performance of any Field Service, perform the tests as described in **5.3 through 5.16** to verify the system operates properly and within specifications prior to placing the unit back into operation.

7.4 FACTORY SERVICE

When the Intelect Transport Combo Therapy System requires factory service, contact the dealer or Chattanooga Group Service Department.

8.1 GENERAL PROCEDURES

A. Tools and Equipment Required

- All Ultrasound Applicators for the unit being serviced.
- Ohmic Instruments UPM DT 10 or UPM DT 100 Ultrasound Power Meter, set to "Watts".
- Degassed Water. **Refer to page 16** for Degassed Water Recipes.

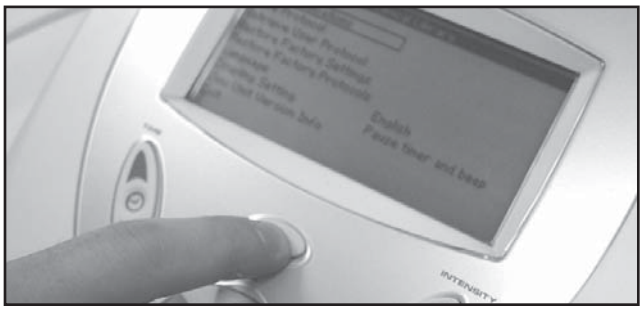


FIGURE 8.1

⚠ WARNING

Use only Degassed Water in Power Meter for calibrating Ultrasound Applicators.

Use of other types of water will cause false readings and bad test results.

See page 16 for Degassed Water Recipes.

Use of other brands or types of tools, equipment, fixtures, materials, and supplies other than those specifically listed on **page 16** will give bad test and calibration results.

If proper equipment is not available or cannot be obtained, send the Ultrasound Applicators to the factory for calibration.

FIGURE 8.2

B. Ultrasound Applicator Calibration Procedures

1. Perform the following on all Ultrasound Applicators for the unit being serviced at least annually.
2. With the system on, press the Clinical Resources button once. **See Figure 8.1.**
3. Simultaneously press and hold the Treatment Time and Intensity Decrease buttons for approximately 2 seconds. **See Figure 8.2**. The calibration procedures screen should display.
4. Press the Down Arrow button until US Applicator Calibration is highlighted.
5. Press the Enter button.
6. Place the Ultrasound Applicator being calibrated into the Ohmic Instruments UPM DT 100 or DT 10 Ultrasound Power Meter and set meter to "Watts". **See Figure 8.3**.
7. Follow the instructions on the LCD Display.
8. When calibration is complete, follow the test procedures in **5.13 and 5.14** to verify that the Applicator is calibrated..

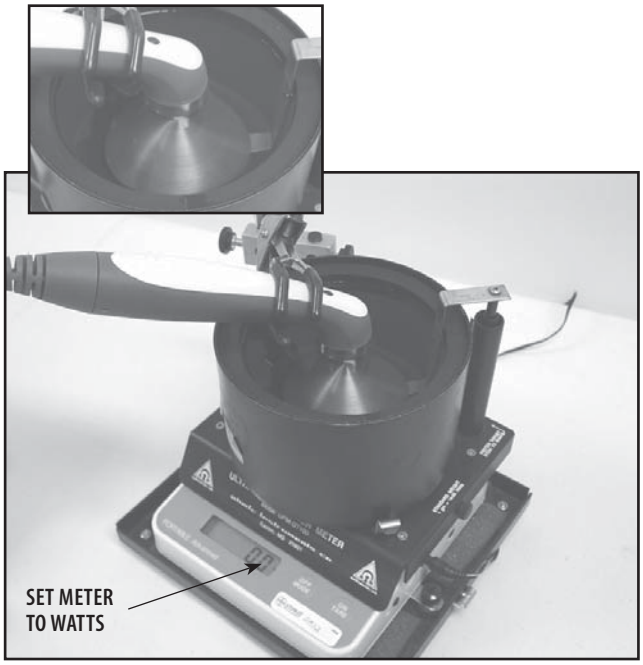
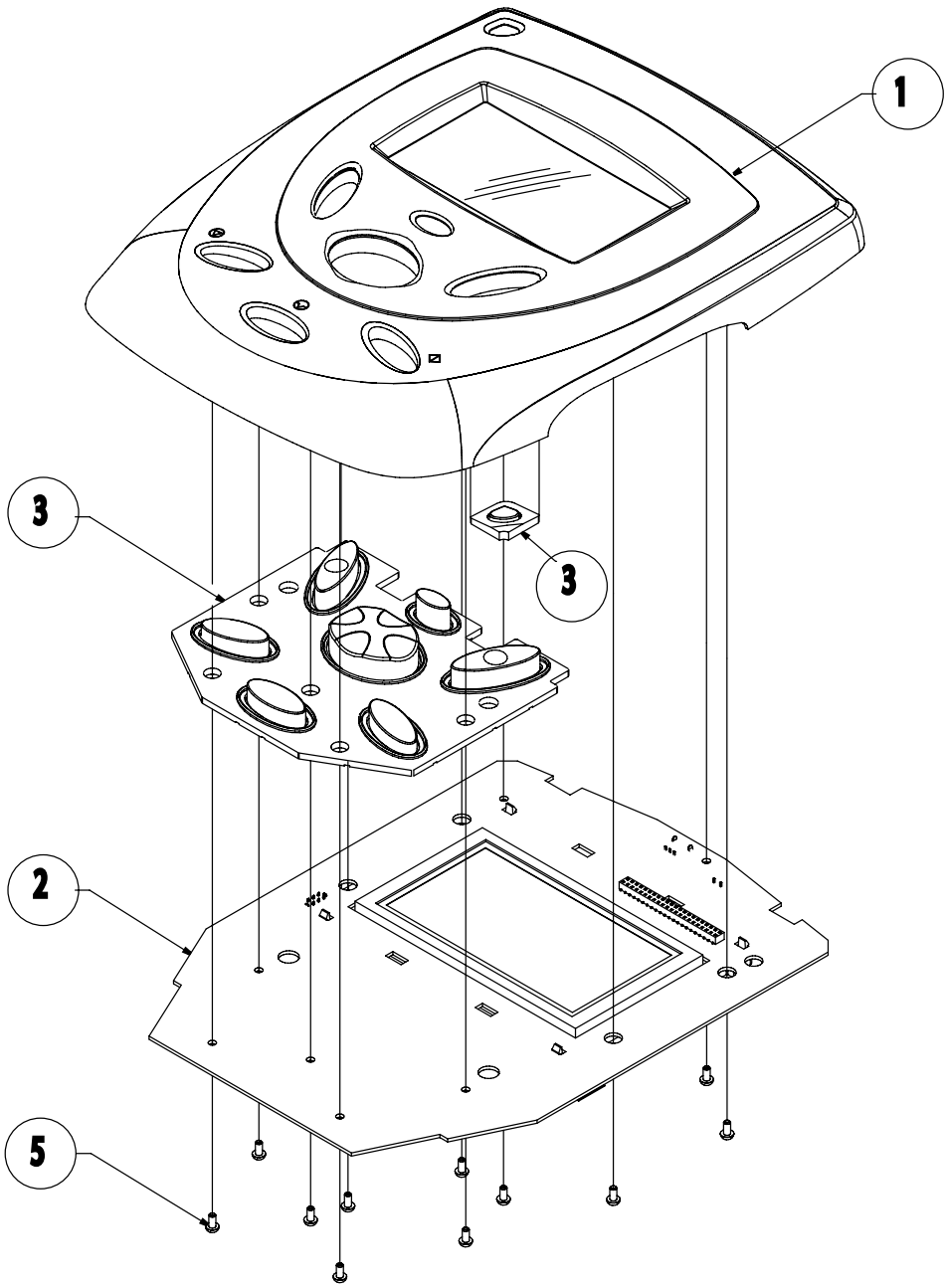


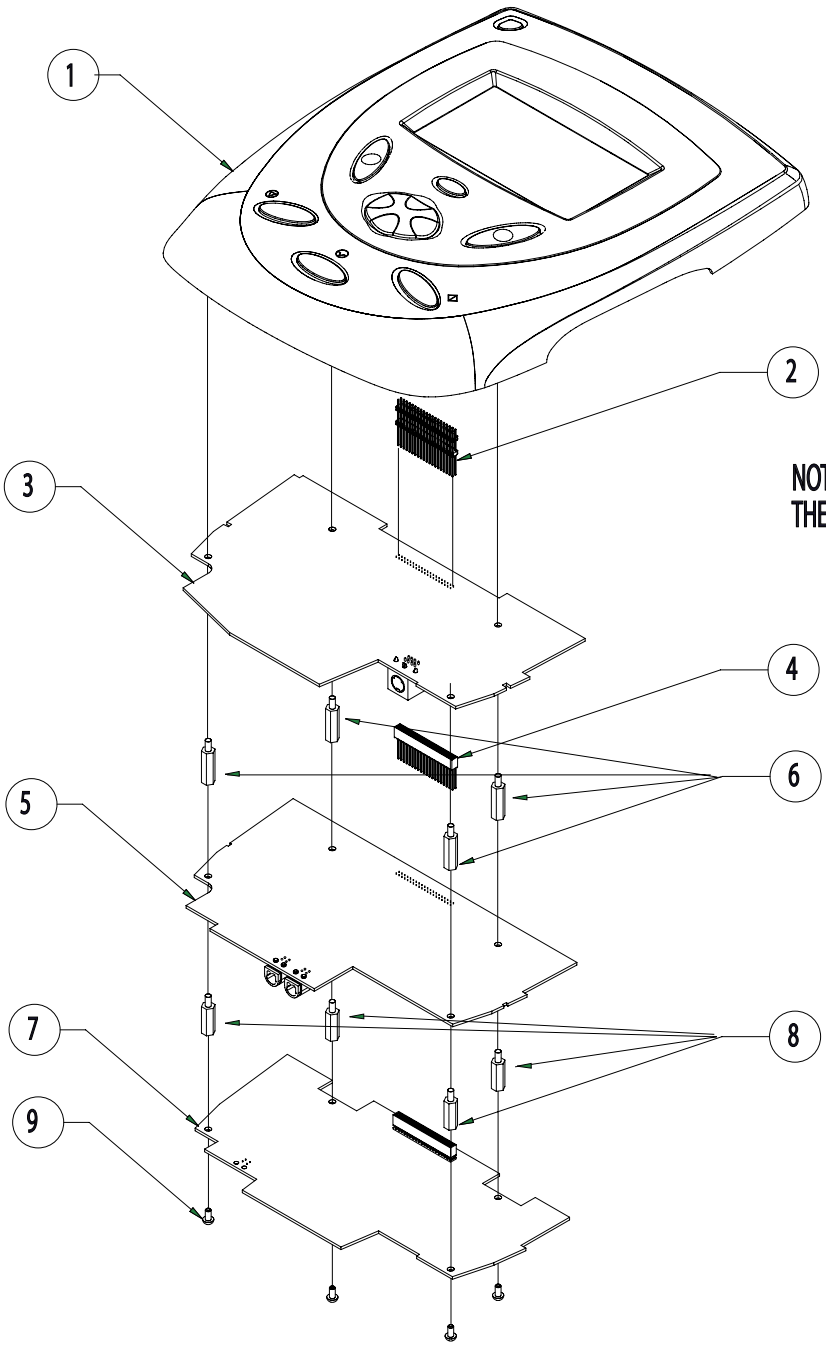
FIGURE 8.3

Intelect Transport Combo Top Assembly



ITEM	PART NO.	DESCRIPTION	QTY
1	27552	Top Assembly	1
2	See LCD Assembly Drawing	Intelect Transport LCD Assembly	1
3	27560	Keymat	1
5	27142	M3 x 6mm Pan Head Screws	11

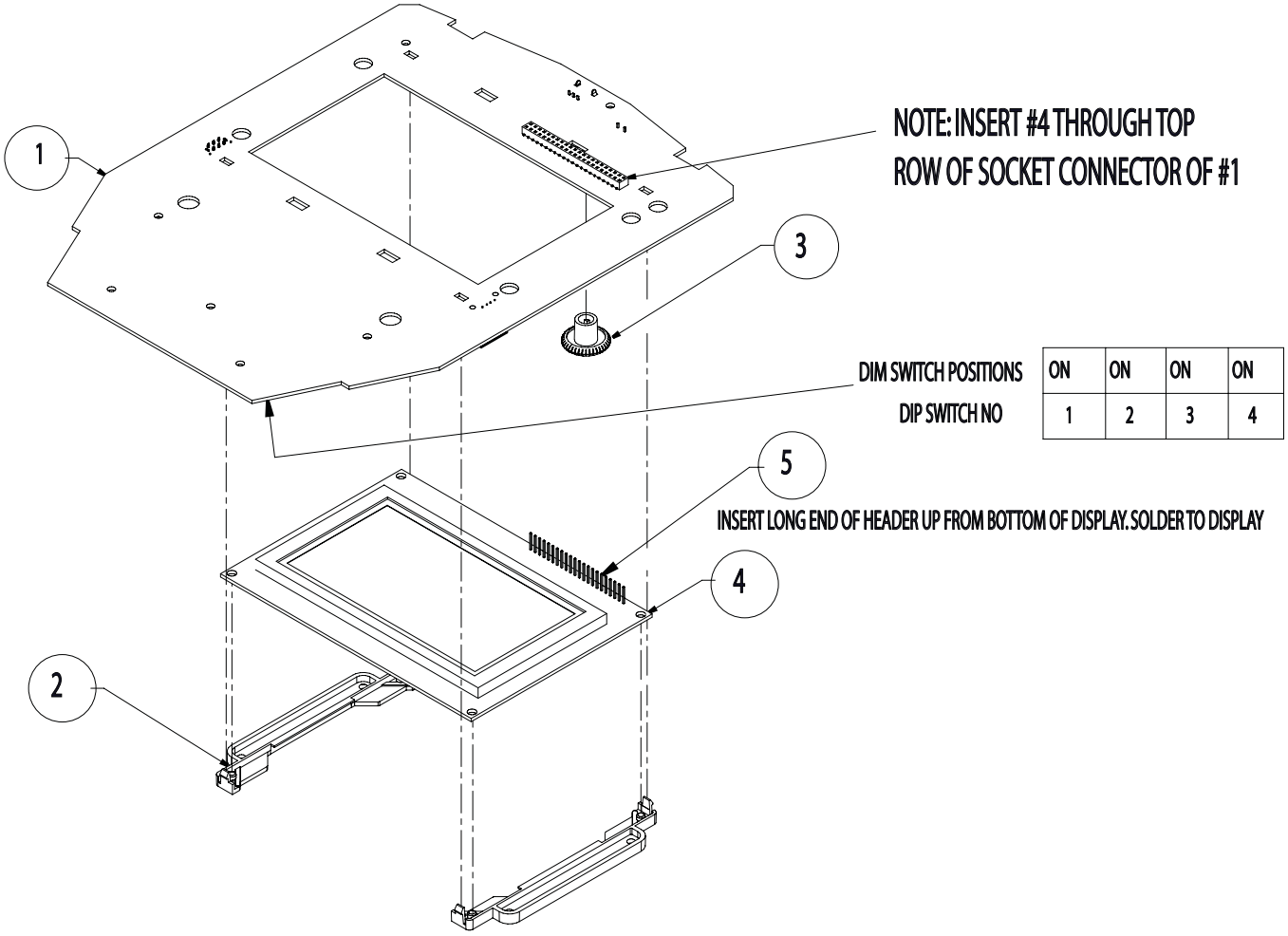
Intelect Transport Combo Ultrasound and Stim Boards



NOTE: INSERT #3 LONG PINS DOWN, INTO PCB #2 FIRST, THEN INTO #1

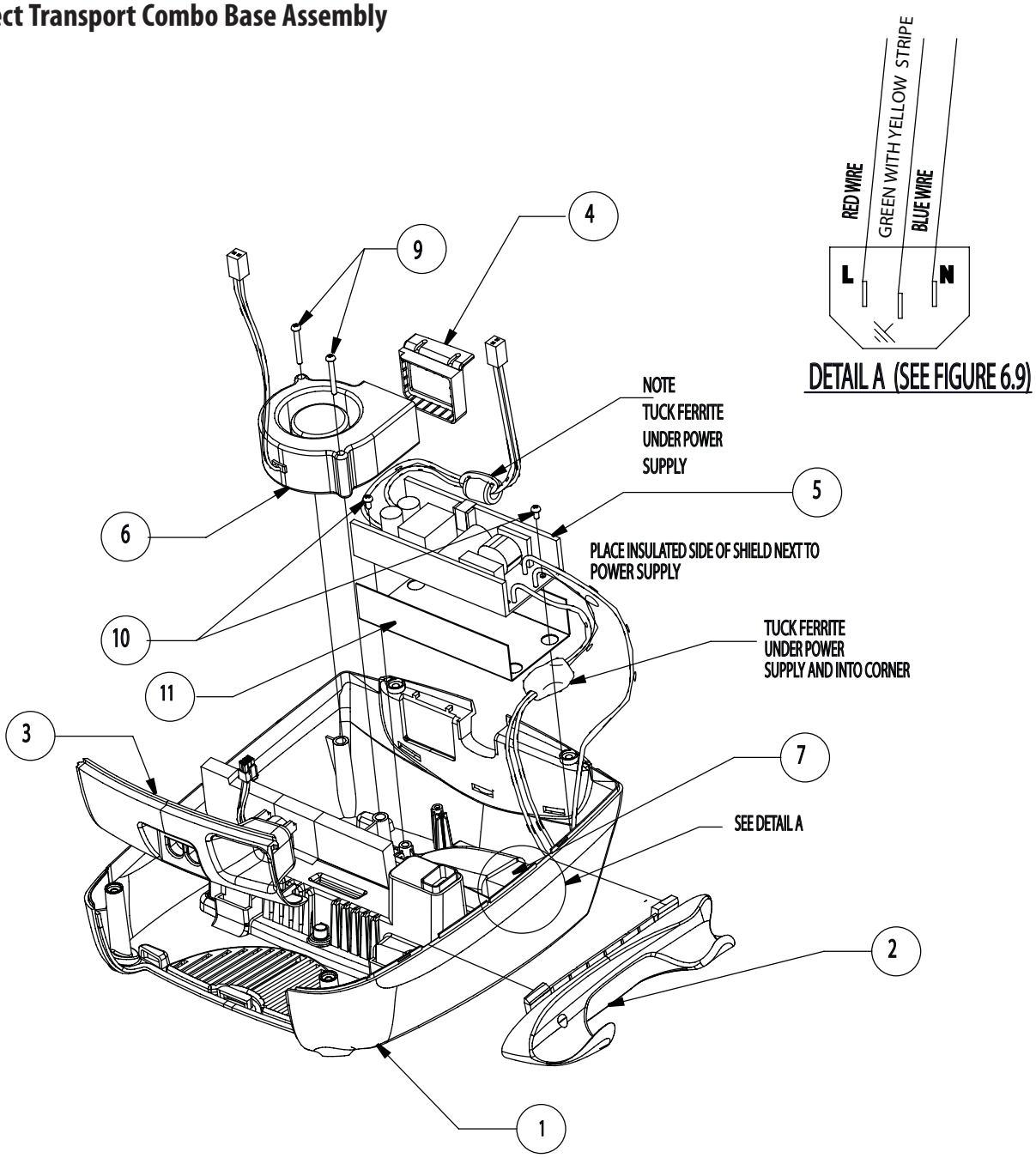
ITEM	PART NO.	DESCRIPTION	QTY
1	See Top Assembly Drawing	Intelect Transport Top Assembly	1
2	28019	Header	1
3	27269	Ultrasound PCB	1
4	28020	Connector	1
5	27498	Channel 2 Stim PCB	1
6	28017	Standoff M3 x 19mm	4
7	27419	Channel 1 Stim PCB	1
8	27770	Standoff M3 x 16mm	4
9	27142	M3 x 6mm Pan Head Screws	4

Intelect Transport Combo LCD Assembly



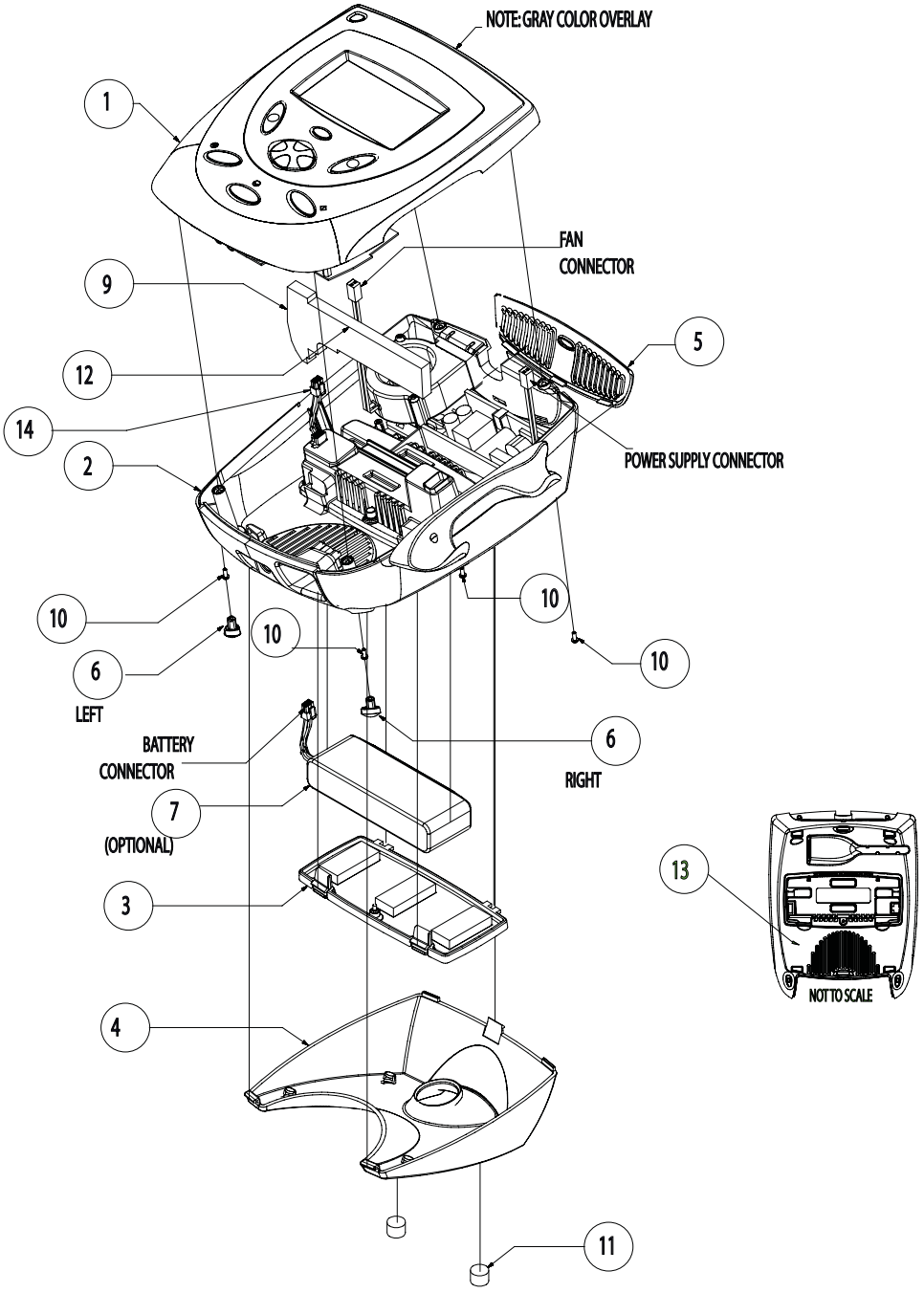
ITEM	PART NO.	DESCRIPTION	QTY
1	27249	PCB Assembly	1
2	27261	LCD Spacer	2
3	27012	Contrast Knob	1
4	27264	LCD	1
5	27588	Header	1

Intelect Transport Combo Base Assembly



ITEM	PART NO.	DESCRIPTION	QTY
1	27983	Base Deep	1
2	27256	Applicator Hang-Up	1
3	27984	Connector Infill Panel	1
4	27367	Fan Seal	1
5	27265	Power Supply	1
6	27158	Fan	1
7	27152	Snap in Inlet (IEC Socket)	1
9	27136	M4 x 35mm	2
10	27142	M3 x 6mm	2
11	27592	Shield T-Port Power Supply	1

Intelect Transport Combo Final Assembly



ITEM	PART NO.	DESCRIPTION	QTY
1	See Top Assembly Drawing	Intelect Transport Top Assembly	1
2	See Base Assembly Drawing	Intelect Transport Base Assembly	1
3	27410	Battery Compartment Cover	1
4	27253	Plinth	1
5	27361	Rear Vent	1
6	27363 27365	Left Foot Right Foot	1 1

ITEM	PART NO.	DESCRIPTION	QTY
7	27267	Optional Battery Pack	1
9	28018	Foam Baffle	1
10	27140	M3 x 8mm Pan Head Screws	4
11	27150	1/2"D x 1/4" H BLK Feet	2
12	27821	Tape 3M	.17FT
13	28155	Serial Decal	1
14	27989	Harness Battery	1

11- WARRANTY

Chattanooga Group, a division of Encore Medical, L. P. ("Company"), warrants that the Intelect Transport Combo Therapy System ("Products") are free of defects in material and workmanship. This warranty shall remain in effect for two years (24 months) from the date of original consumer purchase. If these Products fail to function during the two years warranty period due to a defect in material or workmanship, at the Company's option, the Company or the selling dealer will repair or replace the respective Product without charge within a period of thirty days from the date on which the Product is returned to the Company or the dealer.

All repairs to the Product must be performed by a service center certified by the Company. Any modifications or repairs performed by unauthorized centers or groups will void this warranty.

The warranty period for certain accessories is 90 days. Accessories consist of Lead Wires, Electrodes, and Nylatex®.

The warranty period for the Battery and Ultrasound Applicators is one year (12 Months).

This Warranty Does Not Cover:

- Replacement parts or labor furnished by anyone other than the Company, the selling dealer, or a certified Company service technician.
- Defects or damage caused by labor furnished by someone other than Company, the selling dealer, or a certified Company service technician.
- Any malfunction or failure in the Product caused by product misuse, including, but not limited to, the failure to provide reasonable and required maintenance or any use that is inconsistent with the Product User's Manual.

COMPANY SHALL NOT BE LIABLE IN ANY EVENT FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some locations do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

To obtain service from Company or the selling dealer under this warranty:

1. A written claim must be made within the warranty period to the Company or the selling dealer. Written claims made to the Company should be sent to:

   Chattanooga Group

   4717 Adams Road

   Hixson, TN 37343 USA

   Phone: 1-800-592-7329 or 1 423-870-2281

   FAX: 1-423-875-5497

   chattgroup.com

   and

2. The Product must be returned to the Company or the selling dealer by the owner. A Return Authorization (RA) Number must be obtained before returning any product to the Company.

   This warranty gives you specific legal rights and you may also have other rights which vary from location to location.

The Company does not authorize any person or representative to create for it any other obligation or liability in connection with the sale of the Product.

Any representative or agreement not contained in the warranty shall be void and of no effect.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

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